THE

University of Maryland

DEPARTMENT OF CHEMISTRY

QUARTERLY

ENTERED AT COLLEGE PARK (MD.) POST OFFICE AS SECOND-CLASS MATTER.

No. 95 FEBRUARY 1922

FERTILIZER ANALYSES

Pages 4-17

FERTILIZER REGISTRATIONS, Pages 18-27

H. B. McDONNELL, Professor in Charge.

Published for the Benefit of Agriculture, and Sent Free to Anyone Desiring a Copy

Issued in the Months of February, May, August and November

ADDRESS

Department of Chemistry, University of Maryland

COLLEGE PARK, MD.

ANALYSES OF

Fertilizers Sold in Maryland

BY THE

UNIVERSITY OF MARYLAND

DEPARTMENT OF CHEMISTRY

N. E. Gordon, Ph. D., State Chemist

Dr. H. B. McDonnell, Professor in Charge.

L. B. Broughton, M. S., Professor of Industrial Chemistry.

R. C. Wiley, B. S., Assistant Professor of Chemistry

L. H. Van Wormer, M. S., Assistant Chemist

R. H. Walls, Assistant Chemist

A. L. Flenner, B. S., Assistant Chemist

D. C. Lichtenwalner, B. S., Instructor in Chemistry

F. G. Baggs, Clerk

R. F. Malone, Stenographer

The tables on the following pages are made up of the results of the Analysis of fertilizers from August 1921, to January 1922, inclusive.

The majority of the samples analyzed are obtained by our sampling agents, the samples being taken while the goods are in transit, on vessels, wharves, cars or stations, from farmers' wagons, barns, etc. It is impossible for us to analyze all samples we collect; duplicates are generally omitted.

When a sample has been sent in by a farmer, his name, or initials, will be found after the "place of sampling." If "place of sampling" is not given, the sample has been made up two or more samples taken at different places.

Before sending samples of fertilizer for analysis, farmers should always send for blank forms and directions, stating the number of blanks wanted. One blank is required for each sample. No sample will be analyzed unless taken and sent as required by law.

The figures in the columns headed "Ammonia," "Potash" and "Phosphoric Acid," are percentages, or pounds per hundred. To get pounds per ton multiply the per cent by 20. The columns headed "Found" contain the results found by analysis; those headed "Guaranteed" contain the essential parts of the guarantee as stamped on the bags.

The "Comparative Value Found" is calculated from the results of analysis as found in our laboratory: the "Comparative Value Guaranteed" is calculated from the manufacturers' guaranteed analysis as printed on the bags in each case using the following schedule:

SCHEDULE FOR CALCULATING COMPARATIVE VALUES.

In Mixed Fertilizers:		
For Nitrogen, calculated as Ammonia	25 cts. per lb.,	$5.00 per unit
For Potash (K_2O)	7½ cts. per lb.,	1.50 per unit
For Available Phosphoric Acil	15 cts. per lb.,	1.00 per unit
For insoluble Phosphoric Acid	1 ct. per lb.,	0.20 per unit
In Dissolved Rock:		
Available Phosphoric Acid	5 cts. per lb.,	1.00 per unit
Insoluble Phosphoric Acid	1 ct. per lb.,	0.20 per unit
In Tankage:		
For Nitrogen, calculated as ammonia	25 cts. per lb.,	5.00 per unit
For Phosphoric Acid	3 cts. per lb.,	0.60 per unit
In Ground Bone:		
For Nitrogen, calculated as ammonia	25 cts. per lb.,	5.00 per unit
For Phosphoric Acid	3 cts. per lb.,	0.60 per unit

Special attention is invited to the comparative values per unit in the above schedule. It is very much easier to make calculations on the unit basis. Thus if Dried Blood containing 10 per cent of Ammonia sells for $5.00 per unit, it means that the selling price is the per unit value multiplied by the per cent of Ammonia, or in this case $50.00 per ton. In the case of a "Complete Fertilizer" with the analysis 2-8-2, if Ammonia is worth $5.00 per unit, Available Phosphoric Acid $1.00 per unit and Potash $1.50 per unit the value per ton would be $10.00, plus $8.00, plus $3.00, giving a value of $21.00 per ton.

Consumers, of fertilizer should, as a rule, purchase the "High-Grade" goods, as the price per unit and the cost of bags, handling, etc., is less for the actual amount of fertilizer received than is the case if "Low-Grade" fertilizers are used. The latter are made by using large amounts of filler.

In the purchase of Acid Phosphate one should always demand 16 per cent goods or better. Acid Phosphate containing 18 per cent may sometimes be obtained. The consumers should be willing to pay more for the 18 per cent than for the 16 per cent goods. There is no excuse, whatever, for 10 per cent and 12 per cent Acid phosphate. It is made from the high grades by mixing in a make-weight or filler. Neither is there no excuse for Mixed Fertilizers containing less than 1 per cent of either Ammonia or Potash, if these are present. The Fertilizer Manufacturers' Association is now working on a scheme to eliminate "Low-Grade" fertilizers from the market and never use less than 2 per cent of Ammonia in an ammoniated fertilizer, never less than 2 per cent of Potash in fertilizer containing Potash, and not less than 14 per cent of total plant food, counting the Ammonia, Phosphoric Acid and Potash together. If this can be done, it will mean a great saving to the farmers, in the handling of extra weight, bags, freight, hauling, etc. However, the success of such a movement will depend to a considerable extent on the attitude of the buyer. If he insists on the stuff that is cheaper per ton, without regard to the amount of actual plant food, it is probable that he will be accommodated.

No.	Name and Address of Manufacturer and Name of Fertilizer	Place of Sampling (and Senders initials when not Sampled by the College Agent.)	NITROGEN Calculated as AMMONIA.		POTASH. K_2O.		PHOSPHORIC ACID.				Comparative Value Per Ton Found.	Comparative Value Per Ton Guaranteed.
							Insoluble.		Available.			
			Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.		
	American Agricultural Chemical C	**o., N. Y., N. Y.**										
42074	Acid Phosphate 16%	Baltimore	.....	.....	.....	.....	1.03	.....	16.82	16.00	$17.03	$16.00
42136	Basic. Lime Phosphate (L. Gr.)	Keedysville	.....	.....	.....	.....	2.10	1.00	13.30	13.00	13.72	13.20
42069	Fish Guano	Baltimore	1.13	1.00	1.04	1.00	1.37	.....	8.38	8.00	15.86	14.50
42049	Josiah Copes Try Me Fert	Rising Sun	2.25	2.00	2.04	2.00	1.20	.....	8.05	8.00	22.60	21.00
42050	Josiah Copes Wht. & Grass Spec.	Rising Sun	1.28	1.00	1.02	1.00	1.75	.....	8.02	8.00	16.30	14.50
42106	Potomac Fertilizer	Williamsport	1.06	1.00	1.12	1.00	1.55	.....	9.25	9.00	16.54	15.50
42118	Red Dragon Guano	Baltimore	2.01	2.00	2.20	2.00	1.25	.....	12.20	12.00	25.80	25.00
42070	Victory Phosphate & Potash	Baltimore	.....	.....	5.80	5.00	1.20	.....	11.90	12.00	20.84	19.50
	A. A. Co. (Canton), Balto., Md.											
42119	Baker's Special	Baltimore	1.14	1.00	2.16	2.00	1.90	.....	9.01	9.00	18.33	17.00
42002	Baker's Fish Guano	Baltimore	2.66	2.00	1.90	2.00	1.65	.....	8.33	8.00	24.81	21.00
	A. A. C. Co. (Detrick), Balto., Md.											
42075	Potato Guano	Baltimore	1.06	1.00	4.04	4.00	1.25	.....	8.75	8.00	20.36	19.00
	A. A. C. Co. (Lister's), Newark,	**N. J.**										
42573	Acid Phosphate H. G.	Parkton	.....	.....	.....	.....	.75	.....	16.05	16.00	16.20	16.00
42120	Grain & Grass Fertilizer	Baltimore	.....	.....	2.20	2.00	1.00	.....	10.05	10.00	13.55	13.00
42574	Harvest Queen Phosphate, Rev.	Parkton	1.33	1.00	3.04	3.00	1.50	.....	9.10	9.00	20.61	18.50
42601	Special Wheat Fertilizer	Baltimore	2.30	2.00	3.24	3.00	1.20	.....	8.50	8.00	25.10	22.50
	A. A. C. Co. (Pollock Fert. Co.),	**Balto,. Md.,**										
42088	Crop Invigorator	Secretary	1.09	1.00	4.28	4.00	1.10	.....	8.60	8.00	20.69	19.00
42123	H. G. Superphosphate	Baltimore	.....	.....	.....	.....	1.42	.....	16.03	16.00	16.31	16.00

42076	Our Brand Guano (Low Grade)	Baltimore	1.18	1.00	.....	.....	2.10	.....	7.70	8.00	$14.02	$13.00
42077	Spec. Wheat & Corn Fertilizer..	Baltimore	1.11	1.00	2.12	2.00	1.28	.....	8.77	8.00	17.76	16.00
	A. A. C. Co. (Susquehanna), Bal	**to., Md.**										
42078	Alkaline Phosphate.....	Baltimore	.....	.....	2.24	2.00	1.20	.....	10.70	10.00	14.30	13.00
42064	Ammoniated Superphosphate...	Baltimore	2.02	2.00	2.48	2.00	1.70	.....	8.40	8.00	22.56	21.00
	A. A. C. Co. (Robert A. Wooldridge Co.)	**Balto,. Md.,**										
42071	Chieftain Phosphate.....	Baltimore	2.01	2.00	2.05	2.00	1.37	.....	8.83	8.00	22.23	21.00
42121	Florida Acid Phosphate.....	Baltimore	.....	.....	.....	.....	.93	.....	15.37	14.00	15.56	14.00
42104	General Crop Grower (L. Gr.).	Friendsville	1.31	1.00	.....	.....	1.13	1.00	8.62	8.00	15.40	13.20
42105	Liberty Bell.....	Friendsville	.....	.....	2.40	3.00	.90	1.00	12.75	12.00	16.53	16.70
42065	No. 2 Phosphate & Potash.....	Baltimore	.....	.....	5.36	5.00	1.10	.....	8.15	8.00	16.41	15.50
42124	Triumph	Baltimore	2.10	2.00	3.04	3.00	1.55	.....	8.25	8.00	23.62	22.50
	American Fertilizing Co., Baltim	**ore, Md.**										
42072	Acid Phosphate, H. G.....	Baltimore	.....	.....	.....	.....	1.55	.....	16.15	16.00	16.46	16.00
42053	Phospho Tobacco (Low Grade).	Sykesville	.....	.....	.....	.....	2.40	.....	13.65	13.00	14.13	13.00
42022	Special Fish Guano.....	Emmitsburg	1.25	1.00	.....	.....	1.75	1.00	11.02	10.00	17.62	15.20
42125	Special Formula (Low Grade).	Baltimore	1.09	.50	2.16	2.00	2.46	.....	8.04	8.00	17.22	13.50
	Armour Fertilizer Works, Baltim	**ore, Md.**										
42138	Big Crop Fertilizer.....	Friendsville	.....	.....	5.48	5.00	1.00	.....	8.25	10.00	16.67	17.50
42066	Bone Mixture.....	Baltimore	2.05	2.00	3.52	3.00	3.80	.....	9.85	9.00	26.14	23.50
42107	Crop Grower.....	Friendsville	1.26	1.00	2.08	2.00	1.27	.....	7.83	8.00	17.50	16.00
42051	Grain Grower.....	Rising Sun	2.35	2.00	2.12	2.00	1.15	.....	8.05	8.00	23.21	21.00
42079	Royal Ammoniated.....	Baltimore	1.23	1.00	4.24	4.00	1 68	.....	8.22	8.00	21.07	19.00
42132	Star Phosphate.....	Baltimore	.....	.....	.....	.....		.....	14.65	14.00	14.76	14.00
	Baltimore Fertilizer Co., Baltim	**ore, Md.**										
42030	Honest Acid Phosphate 16%....	Bel Air.....	.....	.....	.....	.....	.35	.....	17.20	16.00	17.27	16.00
42140	Honest Ammoniated Bone.....	Fallston	2.08	2.00	2.12	2.00	1.30	.....	7.95	8.00	21.79	21.00
42126	Honest Buyer's Mixture.....	Baltimore	.....	.....	4.24	5.00	.75	.....	10.70	10.00	17.21	17.50
42032	Honest 1-9-3.....	Glyndon	1.11	1.00	3.05	3.00	1.35	.....	10.35	9.00	21.35	18.50
42033	Old Honesty (Low Grade)....	Glyndon	.99	.50	2.32	2.00	1.10	.....	8.15	8.00	16.80	13.50
	Baltimore Pulverizing Co., Balto.,	**Md.**										
42073	Spec. Spring & Fall Mix. (L. G.)	Baltimore	.....	.....	1.60	1.00	2.30	.....	6.85	8.00	9.71	9.50
	Baugh & Sons Co., Baltimore, Md.											
42013	Acid Phosphate 16%.....	Baltimore	.....	.....	.....	.....	.22	.....	16.88	16.00	16.92	16.00
42052	Complete Animal Base Fert....	Conowingo	2.13	2.00	5.44	5.00	1.12	.....	8.02	8.00	27.05	25.50

No.	Name and Address of Manufacturer and Name of Fertilizer	Place of Sampling (and Senders initials when not Sampled by the College Agent.)	NITROGEN Calculated as AMMONIA.		POTASH. K_2O.		PHOSPHORIC ACID.				Comparative Value Per Ton Found.	Comparative Value Per Ton Guaranteed.
							Insoluble.		Available.			
			Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.		
	Baugh & Sons Co., Baltimore, Md.											
42054	Economical Crop Producer.....	Mt. Airy.....	1.37	1.00	2.16	2.00	1.10	.....	8.40	8.00	$18.71	$16.00
42055	Excelsior Guano.....	Mt. Airy.....	1.48	1.00	4.36	4.00	1.40	.....	8.20	8.00	22.42	19.00
42141	General Crop Grower.....	Mt. Airy.....	1.06	1.00	1.04	1.00	.90	.....	8.05	8.00	15.09	14.50
42134	Grand Rapid Guano.....	Baltimore	3.41	3.00	3.20	3.00	1.17	.....	7.53	9.00	29.61	28.50
42133	Half & Half Mixture.....	Baltimore	2.01	1.50	.....	.....	9.80	.....	8.90	12.00	20.91	19 50
42089	Lime & Phosphate (Low Grade)	Secretary.	.....	.....	.....	.....	2.75	.....	12.35	13.00	12.90	13.00
42056	Phosphate & Potash Mixture...	Mt. Airy.....	.....	.....	5.32	5.00	1.20	.....	11.90	12.00	20.12	19.50
42005	Pure Steamed Bone.....	Baltimore	2.58	2.00	.....	.....	*25.10	*25.00	.....	.....	27.96	25.00
42451	Raw Bone Meal.....	Ellicott City.....	4.68	4.50	.....	.....	*20.10	*21.50	.....	.....	35.46	35.40
42007	Wheat Fertilizer.....	Baltimore	2.12	2.00	2.62	2.00	1.80	.....	8.90	8.00	23.79	21.00
	Beckley Fertilizer Co., Half Way, Md.											
42108	Bone Mixture.....	Half Way.....	1.84	1.50	.....	.....	1.35	.....	14.25	14.00	23.72	21.50
42109	Crop Grower.....	Half Way.....	1.59	1.00	.....	.....	1.38	.....	12.32	12.00	20.55	17.00
42110	Potash Mixture.....	Half Way.....	.....	.....	4.12	4.00	.82	.....	10.83	10.00	17.17	16.00
42460	Special Fish Mixture.....	Hagerstown.	1.54	1.50	.....	.....	1.62	.....	9.78	10.00	17.80	17.50
	N. T. Bennett, New Windsor, Md.											
42034	Acid Phosphate.....	New Windsor.....	.....	.....	.....	.....	.90	.....	16.65	16.00	16.83	16.00
42057	Butcher House Phosphate.....	New Windsor.....	1.33	1.00	4.36	3.00	.57	.....	10.63	9.00	23.93	18.50
42058	Wheat Grower.....	New Windsor.....	1.35	1.00	2.56	2.00	.47	.....	10.53	8.00	21.21	16.00
	Herbert Bryant's Son, Alexandria, Va.,											
42035	Belle Haven Ammoniated Bone.	Silver Spring.....	2.13	2.00	5.46	5.00	1.67	.....	8.33	8.00	27.50	25.50

42036	Empress Ammoniated Bone....	Silver Spring.....	1.50	1.00	1.12	1.00	1.12	.....	8.43	8.00	$17.83	$14.50
42037	Fish Bone & Potash.....	Washington Grove	2.13	2.00	2.16	2.00	1.95	.....	9.05	9.00	23.33	22.00
42038	Genuine Fish Bone & Potash..	Silver Spring	2.10	2.00	2.12	2.00	1.75	.....	9.10	9.00	23.13	22.00
	Central Chemical Co., Hagerstown, Md.											
42471	Acid Phosphate 16%.....	Burdette	.....	.....	.....	.....	.95	.....	16.60	16.00	16.79	16.00
42461	Canner's Special.....	Hagerstown	2.03	2.00	4.92	5.00	1.07	.....	8.68	8.00	26.42	25.50
42462	Commonwealth	St. James.....	.....	.....	2.04	2.00	.50	.....	9.55	10.00	12.71	13.00
42463	Crown Jewel.....	Hagerstown	1.13	1.00	3.16	3.00	1.27	.....	8.53	9.00	19.17	18.50
42143	Crown Jewel.....	Hancock	1.31	1.00	3.02	3.00	.85	.....	9.05	8.00	20.30	18.50
42464	Dissolved Phosphate.....	Hagerstown	.....	.....	.....	.....	1.02	.....	16.18	16.00	16.38	16.00
42024	Dissolved Phosphate.....	Graceham	.....	.....	.....	.....	.68	.....	16.02	16.00	16.16	16.00
42465	Excelsior	Hagerstown	2.20	2.00	3.52	4.00	2.12	.....	7.58	8.00	24.28	24.00
42466	Farmer's Compound.....	Hagerstown	1.98	1.50	.....	.....	1.37	.50	13.33	14.00	23.50	21.60
42025	Farmer's Mixture.....	Graceham	1.45	1.00	2.04	2.00	1.35	.....	8.95	8.00	19.53	16.00
42039	Fish Compound.....	Silver Spring....	1.91	1.50	.....	.....	1.40	.....	10.30	10.00	20.13	17.50
42026	Golden Sheaf.....	Monrovia	1.45	1.00	1.08	1.00	.95	.....	8.65	8.00	17.71	14.50
42468	Grain & Grass Grower.....	Hagerstown	2.10	2.00	2.20	2.00	1.15	.....	11.15	12.00	25.18	25.00
42027	Grain & Grass Grower.....	Graceham	2.22	2.00	2.12	2.00	1.50	.....	12.02	12.00	26.60	25.00
42458	J. B. Jones Mixture.....	New Market (J. B. J.)..	1.28	.45	5.32	5.00	4.85	.....	12.15	12.00	27.50	21.75
42081	Manure Salt.....	Baltimore	.....	.....	20.20	20.00	.....	.....	.....	.....	.....	.....
42467	Planter's Mixture.....	Hagerstown	1.88	2.00	.....	.....	1.55	.....	10.15	10.00	19.86	20.00
42469	Potash Special.....	Hagerstown	.....	.....	4.80	5.00	.52	.....	12.58	12.00	19.88	19.50
42499	Potash Special.....	Rock Hall (W.M.S.)	.....	.....	5.16	5.00	.40	.....	12.95	12.00	20.77	19.50
42082	Potash Special.....	Baltimore	.....	.....	5.48	5.00	.33	.....	12.82	12.50	21.11	20.00
42111	Pride of the Valley.....	Hancock	1.30	1.00	.....	.....	1.28	.....	11.17	10.00	17.93	15.00
42459	Special Park's Mixture.....	Chestertown (W.M.S.)..	1.64	1.00	5.03	5.00	.90	.....	11.25	11.00	27.18	23.50
42470	Valley Mixture.....	Hagerstown	2.02	2.00	2.08	2.00	1.37	.....	8.02	8.00	21.51	21.00
	Chesapeake Plant & Animal Food Co., Balto., Md.											
42456	2-10-2	Ellicott City.....	2.27	2.00	1.72	2.00	.75	.....	13.65	10.00	27.73	23.00
	Crisfield Fertilizer Co., Crisfield, Md.											
42021	Ground Crab Scrap.....	Crisfield.	5.05	4.75	.....	.....	*3.65	*2.00	.....	.....	27.44	24.95
	Dorchester Fertilizer & Lime Co., Cambridge, Md.											
42497	Acid Phosphate.....	Cambridge. (J.E.P.)	.....	.....	.....	.....	.55	.....	17.10	16.00	17.21	16.00
42090	Lime Phosphate, (Low Grade) .	Cambridge.	.43	.15	.32	.12	2.30	.....	8.02	8.00	11.11	8.93
42495	Muriate of Potash.....	Cambridge. (J.E.P.)	.....	.....	51.75	54.35	.....	.....	.....	.....	.....	.....
42091	Old Dorset.....	Cambridge.	1.02	1.00	4.24	4 00	1.38	.....	9.42	8.00	21.16	19.00
42092	Old Glory.....	Cambridge.	.....	.....	5.20	5.00	.18	.....	12.27	12.00	20.11	19.50

*Total Phosphoric Acid.

No.	Name and Address of Manufacturer and Name of Fertilizer	Place of Sampling (and Senders initials when not Sampled by the College Agent.)	NITROGEN Calculated as AMMONIA.		POTASH. K_2O.		PHOSPHORIC ACID.				Comparative Value Per Ton Found.	Comparative Value Per Ton Guaranteed.
							Insoluble.		Available.			
			Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.		
	Dorchester Fertilizer & Lime Co.,	**Cambridge, Md.**										
42093	Our Special	Cambridge.	.85	1.00	3.04	2.00	1.25	.....	9.15	8.00	$18.21	$16.00
42094	10-5	Cambridge	.....	.....	5.20	5.00	.98	.....	10.42	10.00	18.42	17.50
	Dudley & Carpenter, Baltimore,	**Md.**										
42095	Wheat Mixture No. 1	Centreville	1.35	1.00	3.04	3.00	1.35	.....	11.90	10.00	23.48	19.50
42096	Wheat Mixture No. 2	Centreville	.....	.....	5.08	5.00	.60	.....	12.50	12.00	20.24	19.50
	Eastern Guano Co., New York, N.	**Y.**										
42112	Economy Brand	Hancock	2.08	2.00	2.09	2.00	.95	.....	12.85	12.00	26.58	25.00
42113	Farmer's Pride	Hancock	2.15	2 00	2.12	2.00	2.10	.....	8.05	8.00	22.40	21.00
42114	Pure Raw Bone	Hancock	5.03	4.50	.....	.....	*21.25	*20.00	.....	.....	37.90	34.50
42116	Valley Phosphate	Hancock	1.30	1.00	3.04	3.00	1.47	.....	9.23	9.00	20.58	18.50
	Eureka Fertilizer Co., Perryville,	**Md.**										
42015	Corn & Potato	Perryville	1.19	1.00	2.88	4.00	.70	1 00	10.05	8.00	20.46	19.20
42016	Potato & Vegetable	Perryville	1.59	1.00	1.68	2.00	1.17	1.00	9.63	8.00	20.33	16.20
42017	Wheat Special	Perryville	2.32	2.00	.....	.....	1.32	1.00	10.78	10.00	22.62	20.20
	Farmers Fertilizer & Feed Co.,	**Westminster, Md.**										
42040	Carroll Phosphate, (Low Grade)	Westminster	1.02	.50	2.16	2.00	1.42	1.00	9.18	8.00	17.80	13.70
42041	No. 3 Phosphate	Westminster	1.74	1.50	3.12	3.00	1.87	1.00	8.93	8.00	22.68	20.20
42117	Your Formula Phosphate	Hagerstown	1.42	1.00	2.08	2.00	.83	.....	10.02	9.00	20.41	17.00
42144	XX Phosphate	Westminster	1.37	1.00	3.02	3.00	1.45	1.00	9.90	9.00	21.57	18.50

	F. Mehring Fertilizer Works, Key	**mar, Md.**										
42145	Acid Phosphate 16%, H. G.	Keymar	.....	.....	.....	.....	.75	.....	16.30	16.00	16.45	16.00
42043	Big Four Crop Grower	Keymar	1.31	1.00	2.28	3.00	1.57	.....	9.02	9.00	19.30	18.50
42044	Half & Half Mixture	Keymar	1.55	1.25	.....	.....	.52	.....	15.53	15.00	23.38	21.25
42146	Mammoth Truck Grower	Keymar	2.30	2.00	5.28	5.00	1.30	.....	9.25	8.00	28.93	25.50
	Farmers & Planters Co., Salisbury,	**Md.**										
42097	Acid Phosphate, H. G.	Salisbury	.....	.....	.....	.....	.50	.....	17.75	16.00	17.85	16.00
42147	General Crop Grower	Salisbury	1.06	1.00	2.48	2.00	.60	.....	10.20	10.00	19.34	18.00
42020	Special Fish Mixture	Salisbury	2.10	2.00	6.76	5.00	.60	.....	9.01	8.00	29.77	25.50
	Griffith & Boyd Co., Baltimore,	**Md.**										
42083	Acid Phosphate 16%	Baltimore	.....	.....	.....	.....	1.00	.....	16.10	16.00	16.30	16.00
42084	Farmers' Queen	Baltimore	1.31	1.00	3.20	3.00	1.02	.....	9.08	9.00	20.63	18.50
42128	Fish & Potash Guano	Baltimore	2.35	1.75	3.04	3.00	1.27	.....	7.18	7.00	23.74	20.25
42148	Peerless Fertilizer (Low Grade)	Baltimore	.84	.50	2.08	2.00	.45	.....	8.45	8.00	15.86	13.50
42131	Reliable Crop Grower	Baltimore	1.50	1.00	1.56	1.00	1.67	.....	8.48	8.00	18.65	14.50
	Hampstead Fertilizer Co., Hamp	**stead, Md.**										
42045	Acid Phosphate 16%	Hampstead	.....	.....	.....	.....	.47	.....	17.13	16 00	17.22	16.00
42047	2-8-4 Fertilizer	Hampstead	2.04	2.00	3.84	4.00	1.57	.....	9.30	8.00	25.30	24.00
	J. Geo. Harr, Baltimore, Md.											
42452	Fish & Potash Mixture	Cockeysville	2.53	2.00	2.08	2.00	2.55	.....	9.35	8.00	23.10	21.00
42454	Fish & Potash Mixture	Cockeysville	2.42	2.00	2.16	2.00	2.97	.....	8.53	8.00	24.46	21.00
	S. M. Hess & Bro., Inc., Phila., Pa.											
42122	Ammoniated Phosphate	Baltimore	2.01	2.00	2.16	2.00	1.45	.....	8.50	8.00	22.08	21.00
	W. H. Hood, Mt. Airy, Md.											
42059	Special Mixture	Mt. Airy	1.35	1.00	1.36	1.00	1.12	.....	10.53	10.00	19.54	16.50
	Horsey, Roe & Co., Greensboro,	**Md.**										
42099	Acid Phosphate 16%	Greensboro	.....	.....	.....	.....	1.20	.....	17.15	16.00	17.39	16.00
42100	Crop Grower 1-8-4	Greensboro	1.19	1.00	4.34	4.00	1.23	.....	8.67	8.00	21.38	19.00
42101	1-8-2	Greensboro	1.42	1.00	2.56	2.00	1.82	.....	8.03	8.00	19.33	16.00
42102	10-4	Greensboro	.....	.....	4.60	4.00	1.03	.....	10.22	10.00	17.33	16.00
42103	12-5	Greensboro	.....	.....	5.12	5.00	.72	.....	12.33	12.00	10.15	19.50
	Hubbard Fertilizer Co., Baltimore,	**Md.**										
42067	Acid Phosphate 16%	Baltimore	.....	.....	.....	.....	.85	.....	17.05	16.00	17.22	16.00
42008	Excelsior Mixture	Baltimore	2.18	2.00	.....	.....	1.20	...	11.01	10 00	22.15	20.00

*Total Phosphoric Acid.

No.	Name and Address of Manufacturer and Name of Fertilizer	Place of Sampling (and Senders initials when not Sampled by the College Agent.)	NITROGEN Calculated as AMMONIA.		POTASH. K_2O.		PHOSPHORIC ACID.				Comparative Value Per Ton Found.	Comparative Value Per Ton Guaranteed.
							Insoluble.		Available.			
			Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.		
	Hubbard Fertilizer Co., Cont.											
42060	Fish Mixture	Woodbine	1.04	1.00	1.32	1.00	2.00	.....	8.35	8.00	$15.93	$14.50
42061	High Grade Potash Mixture	Woodbine	.....	.....	4.08	4.00	.95	.....	10.60	10.00	16.91	16.00
42062	1-8-3	Woodbine	1.25	1.00	3.64	3.00	1.25	.....	9.20	8.00	21.16	17.50
42450	Kainit	Centreville	.....	.....	14.40	14.00	.....	.....	.....	.....	.....	.....
42009	Money Maker	Baltimore	2.35	2.00	5.04	5.00	1.30	.....	8.02	8.00	27.59	25.50
42068	Phosphate & Potash	Baltimore	.....	.....	2.20	2.00	1.10	.....	11.85	10.00	15.37	13.00
42063	12-5 Alkaline	Woodbine	.....	.....	4.80	5.00	1.15	.....	13.02	12.00	20.45	19.50
	M. P. Hubbard Co., Inc., Baltimore, Md.											
42129	Big Jim Compound (Low Grade)	Baltimore	1.02	.50	1.03	1.00	.60	.....	7.80	8.00	14.57	12.00
42086	Special Acid Phosphate 16%	Baltimore	.....	.....	.....	.....	1.65	.....	16.02	16.00	16.35	16.00
42130	Special Twelve—Five Mixture	Baltimore	.....	.....	4.92	5.00	.70	.....	12.02	12.00	19.54	19.50
	Lancaster Chemical Co., Lancaster, Pa.											
42502	Dewey Brand	Perryville	1.88	1.50	1.84	2.00	.90	1.00	8.70	8.00	21.04	18.70
42503	Dissolved Animal Bone & Potash	Perryville	1.91	2.00	3.52	4.00	.60	1.00	10.45	10.00	25.40	26.20
42614	Economist Fertilizer (L. G.)	Perryville	.....	.....	.....	.....	1.30	1.00	11.95	10.00	12.21	10.20
42504	Grain Special (Low Grade)	Perryville	.82	.50	1.02	1.00	.87	1.00	10.38	8.00	16.18	12.20
42505	Keystone Brand (Low Grade)	Perryville	1.14	1.00	.....	.....	.92	1.00	10.43	8.00	16.31	13.20
42506	Phosphoric Acid Special	Perryville	.....	.....	.....	.....	1.00	1.00	15.60	16.00	15.80	16.20
42507	Potato Special	Perryville	1.81	2.00	2.28	3.00	.62	1.00	11.08	9.00	23.67	23.70
42508	Success Brand	Perryville	1.11	1.00	3.28	4.00	.82	1.00	9.78	8.00	20.41	19.20
42509	Wheat Special	Perryville	1.86	2.00	2.24	2.00	.80	1.00	9.75	8.00	22.57	21.20

	Martin Fertilizer Co., Phila., Pa.											
42663	Bull Head Brand Bone Meal...	Baltimore	3.86	3.00	.....	.....	*26.55	*22.72	.....	.....	$35.23	$28.63
42665	Bull Head Brand Dried Blood..	Baltimore	16.02	16.00	.....	.....	.....	.....	.....	.....	.....	.....
	Maryland Milling & Supply Co.,	**Sykesville, Md.**										
42580	Acid Phosphate H. G.....	Sykesville	.....	.....	.....	.....	.65	.....	16.80	16.00	16.93	16.00
42581	Fish Bone & Potash.....	Sykesville	1.84	1.00	2.20	2.00	4.25	.....	7.65	9.00	21.00	17.00
42582	Newman's Grain Producer (L. G.)	Sykesville	1.66	1.00	.....	.....	.60	.....	7.90	9.00	16.32	14.00
42583	Warfield's Wheat & Grass Mix..	Sykesville	1.16	1.00	1.15	1.00	.95	.....	7.70	8.00	15.42	14.50
	Massey & Kilbourne, Chestertown,	**Md.**										
42510	Acid Phosphate 16%.....	Chestertown	.....	.....	.....	.....	.42	.....	16.23	16.00	16.31	16.00
42668	10 & 5 Super Phosphate.....	Chestertown	.....	.....	5.16	5.00	.20	.....	10.55	10.00	18.33	17.50
42615	Try Me Super Phosphate (L. G.)	Chestertown	.89	.50	2.24	2.00	1.45	.....	11.15	9.00	19.25	14.50
42616	12 & 5 Super Phosphate.....	Chestertown	.....	.....	4.60	5.00	1.05	.....	12.20	12.00	19.31	19.50
42512	12 & 3 Super Phosphate.....	Chestertown	.....	.....	3.48	3.00	1.15	.....	12.20	12.00	17.65	16.50
	Miller Fertilizer Co., Baltimore,	**Md.**										
42551	Acid Phosphate.....	Alesia	.....	.....	.....	.....	1.05	.....	17.02	16.00	17.23	16.00
42652	Clinch Phosphate, (Low Grade)	Baltimore	.....	.....	2.12	2.00	.70	.....	11.20	10.00	14.52	13.00
42669	Club Special, (Low Grade)....	Baltimore	1.01	.50	2.16	2.00	.95	.....	9.40	8.00	17.88	13.50
42553	Harvest Queen Phosphate.....	Lineboro	1.40	1.00	2.56	3.00	1.05	.50	8.75	9.00	19.80	18.60
42554	Hustler Phosphate.....	Alesia	1.23	1.00	1.04	1.00	1.00	.50	8.50	8.00	16.41	14.60
	Natural Guano, Co., Aurora, Ill.											
42666	Sheep Head Pulv. Sheep Manure	Baltimore	3.33	2.73	2.63	2.50	1.35	.....	.75	1.00	21.63	16.90
	Nitrate Agencies Co., New York,	**N. Y.**										
42555	Acid Phosphate.....	Barnesville	.....	.....	2.12	.....	.30	.....	16.50	16.00	16.56	16.00
42556	Fall Grain Mixture Naco Brand	Germantown	2.03	2.00	2.16	2.00	1.52	.....	10.33	10.00	24.02	23.00
42557	Fall Grain Mixture 2-10-2.....	Barnesville	2.10	2.00	2.80	2.00	1.40	.....	9.70	10.00	24.68	23.00
42558	Wheat Mixture 2-12-2.....	Barnesville	2.02	2.00	2.32	2.00	.63	.....	12.47	12.00	26.18	25.00
42559	Wheat Mixture Naco Brand....	Germantown	2.12	2.00	2.03	2.00	1.17	.....	12.43	12.00	26.31	25.00
	G. Ober & Sons Co., Baltimore,	**Md.**										
42670	Acid Phosphate H. G.....	Baltimore	.....	.....	.....	.....	.30	.....	17.10	16.00	17.16	16.00
42602	Avondale Amm'd Dissolved Bone	Baltimore	2.04	2.00	1.52	1.00	.95	.....	9.05	8.00	21.72	19.50
42661	Farmers' Mixture.....	Baltimore	1.35	1.00	2.48	2.00	1.45	.....	9.05	9.00	19.81	17.00
42575	Golden Top Wheat & Corn Crower	Fallston	1.28	1.00	3.36	3.00	.80	.....	9.50	9.00	21.10	18.50
42576	Liberty Fish Guano.....	Fallston	1.43	1.25	.....	.....	1.70	.....	13.30	13.00	20.79	19.25
42671	Sol. Amm'd. Superphos. of Lime	Baltimore	2.15	2.00	2.20	2.00	.60	.....	8.40	8.00	22.57	21.00

*Total Phosphoric Acid.

No.	Name and Address of Manufacturer and Name of Fertilizer	Place of Sampling (and Senders initials when not Sampled by the College Agent.)	NITROGEN Calculated as AMMONIA.		POTASH. K_2O.		PHOSPHORIC ACID.				Comparative Value Per Ton Found.	Comparative Value Per Ton Guaranteed.
							Insoluble.		Available.			
			Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.		
	G. Ober & Sons Co., Cont.											
42608	Special Plant Food	Baltimore	2.01	2.00	4.44	5.00	.85		10.70	9.00	$27.58	$26.50
42617	Super Phosphate & Potash	Secretary			2.24	2.00	1.05		10.95	10.00	14.52	13.00
	Oyler & Spangler, Gettysburg, Pa.											
42534	16%	Emmitsburg					1.25		16.50	16.00	16.75	16.00
42535	Crop Grower	Emmitsburg	1.13	1.00	2.48	3.00	1.55		10.05	9.00	19.73	18.50
42536	Excelsior	Emmitsburg	2.01	2.00	3.60	4.00	1.55		8.75	8.00	24.51	24.00
	Patapsco Guano Co. Baltimore, Md.											
42500	High Grade Phosphate	Baltimore					1.55		15.80	16.00	16.11	16.00
42004	Lime Phosphate, (Low Grade)	Baltimore					1.60	1.00	13.45	13.00	13.77	13.20
42609	Sea Gull Guano	Baltimore	1.02	1.00	1.16	1.00	1.30		8.10	8.00	15.20	14.50
	Patuxent Guano Co., Baltimore, Md.											
42010	Beaver Brand Guano	Baltimore	1.47	1.00	3.04	3.00	1.07		9.93	9.00	22.05	18.50
42603	Farmers' Friend, (Low Grade)	Baltimore	.75	.50	2.08	2.00	.65		7.60	8.00	14.60	13.50
42604	Fish Guano	Baltimore	1.35	1.00	2.28	2.00	1.20		9.85	8.00	20.26	16.00
	Peerless Fertilizer Co., Chestertown, Md.											
42618	Club Mixture, (Low Grade)	Easton Landing	.85	.50			.30		9.20	10.00	13.51	12.50
42619	Fish Mixture	Chestertown	2.51	2.00	3.20	3.00	.70		9.90	8.00	27.53	22.50
42672	Ford's Ideal, (Low Grade)	Chestertown	.87	.50	3.40	3.00	.20		9.80	8.00	19.29	15.00
42622	Our Peerless Fertilizer	Chestertown	2.18	2.00	5.08	5.00	.89		10.70	8.00	29.38	25.50
42673	Our Wheat Grower, (L. G.)	Easton Landing	.78	.50	4.22	5.00	.85		11.50	10.00	21.80	20.00
42620	Rock 16%	Easton Landing					.30		16.10	16.00	16.16	16.00

42621	10 & 5	Chestertown	.....	.....	3.92	5.00	.30	.....	12.30	10.00	18.24	17.50
42515	10 & 2	Chestertown	.....	.....	2.18	2.00	.40	.....	10.85	10.00	14.20	13.00
42623	Truckers' Pride	Chestertown	7.15	7.00	6.06	5.00	.85	.....	8.90	6.00	53.91	48.50
	Piedmont—Mt. Airy Guano Co.,	**Baltimore, Md.**										
42475	Levering's Acid Phosphate 16%.	Forest Hill	.....	.....	.....	.....	1.68	.....	17.07	16.00	17.41	16.00
42476	Levering's Acid Phosphate 16%.	Aberdeen	.....	.....	.....	.....	1.75	.....	16.10	16.00	16.45	16.00
42655	Levering's Acid Phosphate 16%.	Baltimore	.....	.....	.....	.....	1.10	.....	15.80	16.00	16.02	16.00
42584	Pied. Ammoniated Bone	Mt. Airy	1.35	1.00	3.04	3.00	1.25	2.00	9.95	9.00	21.51	18.90
42001	Pied. Amm'd Phos. & Potash	Baltimore	2.47	3.00	3.02	3.00	.90	.....	8.75	8.00	25.81	27.50
42777	Pied. Dissolved Animal Bone	Aberdeen	2.13	2.50	.....	.....	.65	.....	11.50	10.00	21.28	22.50
42585	Piedmont Economy (L. Gr.)	Mt. Airy	.75	.25	.....	.....	1.00	.....	11.45	10.00	15.40	11.25
42478	HCFF Fish Base Special	Aberdeen	2.08	2.00	2.16	2.00	2.10	1.00	8.55	8.00	22.61	21.20
42479	Pdmt. 10% Fish Tankage	Forest Hill	11.35	10.00	.....	.....	.....	.....	.....	.....	.....	.....
42480	HCFF General Crop Grower	Forest Hill	1.31	1.00	3.64	4.00	1.20	.....	8.25	8.00	20.74	19.00
42481	HCFF General Crop Grower	Forest Hill	1.14	1.00	4.24	4.00	1 25	.....	8.95	8.00	21.26	19.00
42577	HCFF Grange Special Mixture	Conowingo	1.79	2.00	5.72	5.00	1.50	1.00	8.10	8.00	25.93	25.70
42492	HCFF Grange Special Mixture	White Hall	2.06	2.00	5.32	5.00	2.00	.....	8.35	8.00	27.03	25.50
42675	HCFF Grange Special Mixture	Forest Hill	2.13	2.00	4.72	5.00	1.50	.....	9.05	8.00	27.08	25.50
42482	Pmbt. Ground Tankage (Animal)	Forest Hill	7.87	9.00	.....	.....	*10.75	*9.00	.....	.....	42.58	47.70
42483	Pdmt. Kainit	Aberdeen	.....	.....	12.00	11.48	.....	.....	.....	.....	.....	.....
42484	Pdmt. Muriate of Potash	Forest Hill	.....	.....	49.00	48.00	.....	.....	.....	.....	.....	.....
42586	Pdmt. Peerless Phosphate	Mt. Airy	1.45	1.00	1.16	1.00	1.30	2.00	8.40	8.00	17.65	14.90
42485	HCFF Pomona Queen	White Hall	2.05	2.00	4.80	4.00	1.72	.....	11.43	10.00	29.22	26.00
42662	Pdmt. Plow Brand	Baltimore	2.02	2.00	2.16	2.00	.92	.....	9.33	8.00	22.85	21.00
42486	Pdmt. Pure Ground Bone	Forest Hill	4.66	4.50	.....	.....	*24.50	*21.51	.....	.....	30.65	28.95
42487	Pdmt. Raw Bone	Aberdeen	4.88	4.50	.....	.....	*22.35	*21.51	.....	.....	31.11	28.95
42587	Pdmt. Stand. Dis. Bone Phos.	Mt. Airy	1.45	1.00	1.20	1.00	1.22	2.00	10.63	10.00	19.92	16.90
42588	Piedmont Standard	Mt. Airy	2.15	2.00	3.08	2.00	1.05	2.00	8.95	8 00	24.53	21.40
42488	Pdmt. Utility Fertilizer	Aberdeen	1.88	2.00	.....	.....	1.68	.....	11.62	10.00	21.36	20.00
42489	Pdmt. Wheat Compound	White Hall	.....	.....	5.92	5.00	1.10	.....	12.20	12.00	21.30	19.50
	Ramsburg Fertilizer Co., Fred	**erick, Md.**										
42639	Alkaline Phosphate	Walkersville	.....	.....	1.56	2.00	1.60	.....	11.10	10.00	13.76	13.00
42537	Ammoniated Bone Phosphate	Monrovia	1.33	1.00	2 08	2.00	1.45	.....	10.15	10.00	20.21	18.00
42539	Excelsior Plant Food	Monrovia	2.10	2.00	2.28	2.00	1.95	.....	10.15	10.00	24.46	23.00
42540	Old Virginia Compound	Monrovia	1.30	1.00	4.16	4.00	1.55	.....	9.60	8.00	22.65	19.00
42541	Queen, (Low Grade)	Monrovia	.96	.50	1.28	1.00	1.95	.....	10.50	10.00	17.61	14.00
42640	Special Rock & Potash	Walkersville	.....	.....	4.56	4.00	1.25	.....	12.95	10.00	20.04	16.00
42542	Super Phosphate	Monrovia	.....	.....	.....	.....	1.65	.....	16.65	16.00	16.98	16.00

*Total Phosphoric Acid.

No.	Name and Address of Manufacturer and Name of Fertilizer	Place of Sampling (and Senders initials when not Sampled by the College Agent.)	NITROGEN Calculated as AMMONIA.		POTASH. K_2O.		PHOSPHORIC ACID.				Comparative Value Per Ton Found.	Comparative Value Per Ton Guaranteed.
							Insoluble.		Available.			
			Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.		
	Ramsburg Fertilizer Co., Fred	**erick, Md. (Cont.)**										
42543	Williams' Wheat & Grass Fert.	Monrovia.....	1.50	1.00	1.68	1.00	1.35	.....	9.75	10.00	$20.04	16.50
	Rasin-Monumental Co., Baltimore,	**Md.**										
42651	Acid Phosphate 16%.....	Baltimore	.....	.....	.....	.....	1.65	.....	17.25	16.00	17.58	16.00
42589	Royal Fish Bone & Potash.....	Mt. Airy	2.59	2.00	3.04	3.00	2.92	.....	8.38	8.00	26.47	22.50
42590	William Penn Crop Grower...	Mt. Airy	1.25	1.00	1.20	1.00	2.40	1.00	8.02	8.00	16.55	14.70
	Reindollar Co., Taneytown, Md.											
42560	Acid Phosphate.....	Taneytown	.....	.....	.....	.....	.35	.....	16.55	16.00	16.62	16.00
42561	Rock & Potash.....	Taneytown	.....	.....	2.04	2.00	.83	.....	12.02	12.00	15.25	15.00
42562	Special Mixture.....	Taneytown	1.42	1.00	4.36	4.00	.80	.....	12.30	10.00	27.10	21.00
	W. E. Robinson & Co., Bel Air,	**Md.**										
42547	Vegetable & Grain Grower....	Vale	2.05	2.00	2.08	2.00	2.65	.....	8.15	8.00	22.05	21.00
	F. S. Royster Guano Co., Balti	**more, Md.**										
42659	Acid Phosphate 14%.....	Baltimore	.....	.....	.....	.....	1.20	.....	14.40	14.00	14.64	14.00
42563	Acid Phosphate 16%.....	Rockville	.....	.....	.....	.....	.32	.....	16.33	16.00	16.39	16.00
42564	Cuckoo Guano.....	Rockville	1.45	1.00	1.12	1.00	1.15	.....	8.15	8.00	17.31	14.50
42565	Fine Ground Bone Meal.....	Rockville	4.39	3.00	.....	.....	*21.85	*22.90	.....	.....	35.06	28.74
42566	Fish Flesh & Fowl.....	Rockville	2.13	2.00	3.12	3.00	1.58	.....	8.02	8.00	13.67	22.50
42658	8-5 Phosphate & Potash.....	Baltimore	.....	.....	5.32	5.00	.50	.....	9.40	8.00	17.48	15.50
42610	Phosphate & Potash.....	Baltimore	.....	.....	5.24	5.00	.65	.....	12.50	12.00	20.49	19.50
42657	Wonder Worker.....	Rockville	1.45	1.00	3.08	3.00	1.67	.....	8.01	8.00	20.21	17.50

	Scott Fertilizer Co., Elkton, Md.												
42624	Genuine German Kainit	Elkton	.....	.....	12.02	12.00	.....	.....	.....	.....	.....	.....	.....
42516	Pennsylvania Potato Grower	Elkton	1.26	1.00	2.02	2.00	.95	.....	8.45	8.00	17.97	16.00	
42517	Potato Grower	Elkton	2.39	2.00	4.40	4.00	1.30	.....	10.45	10.00	29.26	26.00	
42518	Soluble Phos. & Potash 10 & 5	Elkton	.....	.....	5.36	5.00	1.10	.....	10.45	10.00	18.71	17.50	
42625	Soluble Phos. & Potash 12 & 2	Elkton	.....	.....	2.24	2.00	.50	.....	12.35	12.00	15.81	15.00	
42519	Special Grain Grower	Elkton	1.14	1.00	1.06	1.00	1.20	.....	8.75	8.00	16.28	14.50	
42520	Standard	Elkton	1.35	1.00	3.28	3.00	1.37	.....	9.33	9.00	21.27	18.50	
42521	Sure Growth Super Phosphate	Elkton	2.15	2.00	2.08	2.00	1.87	.....	8.03	8.00	22.27	21.00	
42626	Tip Top Soluble Phos. 16%	Elkton	.....	.....	.....	.....	1.35	.....	16.30	16.00	16.57	16.00	
42522	Victory Brand	Elkton	2.08	2.00	3 09	3.00	1.45	.....	8.30	8.00	23.63	22.50	
42627	Wheat & Grass, (Low Grade)	Elkton	.97	.50	2.32	2.00	.90	.....	8.70	8.00	17.21	13.50	
	H. G. Snyder Company, Keedysville, Md.												
42660	Money Saving Phosphate	Keedysville	2.02	2.00	2.12	2.00	.70	.....	8.30	8.00	21.72	21.00	
	W. H. Streett & Co., Fallston, Md.												
42605	Ammoniated Dissolved Bone	Baltimore	1.79	1.50	1.20	1.00	1.40	.....	9.55	9.00	20.58	18.00	
	Superior Guano Co., Baltimore Md												
42611	Acid Phosphate 16%	Baltimore	.....	.....	.....	.....	1.40	.....	16.15	16.00	16.43	16.00	
42678	Amm'd Phosphate & Potash	Baltimore	1.33	1.00	2.08	2.00	.75	.....	9.05	8.00	18.97	16.00	
42011	Caroline Special	Baltimore	1.13	1.00	3.28	3.00	.75	.....	9.95	9.00	20.67	18.50	
42612	Royal Crop Grower	Baltimore	1.09	1.00	4.03	4.00	2.75	.....	8.02	8.00	20.07	19.00	
42657	Special Mixture	Baltimore	1.28	1.00	3.52	3.00	1.15	.....	12.05	12.00	23.96	21.50	
42598	Wheat Special, (Low Grade)	Baltimore	.....	.....	1.12	1.00	.40	.....	7.40	8.00	9.16	16.00	
	Swift & Company, Baltimore Md												
42474	Acid Rock	Forest Hill	.....	.....	.....	.....	1.55	.....	17.25	16.00	17.56	16.00	
42680	Acid Phosphate, H. G.	Baltimore	.....	.....	.....	.....	.95	.....	16.85	16.00	17.04	16.00	
42650	Garden City Phosphate	Baltimore	.....	.....	.....	.....	1.60	.....	14.10	14.00	14.42	14.00	
42599	Champ. Wheat & Corn Grower	Baltimore	2.10	2.00	2.08	2.00	1.00	.....	13.05	12.00	25.87	25.00	
42578	Grain Fertilizer 1-8-2	Conowingo	1.28	1.00	2.04	2.00	.49	.....	8.25	8.00	17.79	16.00	
42490	High Grade Special	Forest Hill	3.04	3.00	3.03	3.00	.85	.....	12.65	12.00	32.57	31.50	
42653	Monarch Phosphate & Potash	Baltimore	.....	....	3.24	3.00	.60	.....	12.25	12.00	17.23	16.50	
42600	Phosphate & Potash	Baltimore	.....	.....	2.10	2.00	.75	.....	10.55	10.00	13.85	13.00	
42606	Phosphate & Potash	Baltimore	.....	.....	4.84	5.00	.65	.....	13.10	12.00	20.49	19.50	
42579	Red Steer 2-8-2	Conowingo	2.34	2.00	2.40	2.00	.55	.....	9 35	8.00	24.76	21 00	
42491	Red Steer 2-8-2	Forest Hill	2.32	2.00	2.12	2.00	.65	.....	8.60	8.00	23.51	21.00	
42613	Special Wheat Grower	Baltimore	1.47	1.00	4.08	4.00	.40	.....	8.98	8.00	22.53	19.00	

*Total Phosphoric Acid.

No.	Name and Address of Manufacturer and Name of Fertilizer	Place of Sampling (and Senders initials when not Sampled by the College Agent.)	NITROGEN Calculated as AMMONIA.		POTASH. K_2O.		PHOSPHORIC ACID.				Comparative Value Per Ton Found.	Comparative Value Per Ton Guaranteed.
							Insoluble.		Available.			
			Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.		
	Tanner Hide & Tallow Co., Hagerstown, Md.											
42646	Bone Phosphate	Hagerstown	2.27	2.00	2.08	2.00	4.00	4.00	10.17	8.00	$25.44	$21.80
42647	Animal Tankage	Hagerstown	5.70	5.00	.....	.....	*15.40	.....	.....	.....	37.74	25.00
	H. S. Taveau & Co., Baltimore, Md.											
42003	Dissolved Bone	Baltimore	2.46	2.50	.....	.....	1.62	.....	12.38	12.00	25.00	24.50
	Thomas & Company, Frederick, Md.											
42667	Acid Phosphate 16%	Union Bridge	.....	.....	.....	.....	.35	.....	16.15	16.00	16.22	16.00
42641	Blood & Bone	Frederick	1.79	2.00	2.20	2.00	.85	.....	8.65	8.00	21.07	21.00
42568	Harvest Queen with Potash	Boyds	1.45	1.25	0.00	2.00	1.80	.....	8.80	10.00	16.41	19.25
42569	Plant Food	Middleburg	1.69	1.00	1.40	3.00	.45	.....	7.50	9.00	18.14	18.50
42546	Sure Crop	Frederick	1.25	1.00	1.28	2.00	.90	.....	8.02	8.00	16.37	16.00
42682	Sure Crop	Union Bridge	1.45	1.00	0.00	2.00	1.60	.....	9.25	8.00	16.82	16.00
	W. B. Tilghman Co., Salisbury, Md.											
42683	Acid Phosphate, H. G.	Salisbury	.....	.....	.....	.....	.75	.....	16.60	16.00	16.75	16.00
42628	Bone Tankage Mixture	Salisbury	2.24	2.00	2.44	2.00	.80	.....	13.05	12.00	28.07	25.00
42525	Fish, Bone Potash Mixture	Salisbury	1.42	1.00	2.04	2.00	1.32	.....	10.83	10.00	21.25	18.00
42526	H. G. Potato Fertilizer	Salisbury	2.82	3.00	5.60	6.00	1.35	.....	8.50	6.00	31.27	30.00
42629	H. G. Phosphate & Potash Mix.	Salisbury	.....	.....	4.88	5.00	.81	.....	13.04	12.00	20.52	19.50
42527	Mixture B	Salisbury	3.63	4.00	4.24	4.00	1.25	.....	8.40	8.00	33.16	34.00
42630	Special 1-8-2	Salisbury	1.38	1.00	2.36	2.00	1.25	.....	8.20	8.00	18.89	16.00
42631	Special 1-9-3	Salisbury	1.50	1.00	3.04	3.00	.80	.....	9.45	9.00	21.67	18.50
42632	Special 2-8-4	Salisbury	2.05	2.00	5.05	4.00	1.30	.....	8.50	8.00	26.59	24.00

42528	Standard Fish Mixture	Salisbury	2.12	2.00	1.78	2.00	1.20		11.25	10.00	24.76	23.00
	United States Guano Co., Balti	**more, Md.**										
42685	Acid Phosphate	Walkersville					.20	.50	16.30	16.00	16 34	16.00
42455	Acid Phosphate	Vienna (H. H. R.)					.30		16.20	16.00	16.26	16.00
42472	Acid Phosphate	Cecilton (E. N. C.)					.20	.50	17.40	16.00	17.44	16.10
42593	Great Grain Grower	Mt. Airy	1.01	1.00	4.80	4.00	1.20		9.95	8.00	22.44	19.00
42594	H. G. Phosphate & Potash	Mt. Airy			4.52	5.00	.65		12.75	12.00	19.66	19.50
42642	Keystone Brand	Walkersville	1.52	1.00	2.08	2.00	.70		10.25	8.00	21.06	16.00
42595	Mammoth Truck Grower	Mt. Airy	2.58	2.00	5.24	5.00	1.40		9.10	8.00	30.14	25.50
42654	1-9-3 Fertilizer	Baltimore	1.23	1.00	2.76	3.00	.85		11.15	9.00	21.61	18.50
42643	Phosphate & Potash	Walkersville			2.12	2.00	1 00		10.90	10.00	14.28	13.00
42688	Rainbow Brand	Williamsport	2.22	2 00	3.32	2.00	1.00		12.95	12.00	27.73	25.00
42686	Stand. Big Four Crop Grower	Baltimore	1.81	1.00	2.24	2.00	1.55		10.25	9.00	20.47	17.00
42648	Star Wheat Grower	Williamsport	2.37	2.00	2.20	2.00	1.95		8.25	8.00	23.79	21.00
42645	Sure Growth Guano	Walkersville	2 47	2.00	2.16	2.00	2.15	.50	10.25	10.00	26.27	23.10
42596	Wheat Accelerator	Mt. Airy	1.06	1.00	2.80	2.00	1.90		11.95	10.00	21.83	18.00
	E. S. Valliant & Son, Church Hill,	**Md.**										
42529	Big Three	Centreville	1.40	1.00	3 14	3.00	.90		10.25	9.00	22.14	18.50
42530	Grain Grower, (Low Grade)	Centreville	.97	.50	2.24	2.00	1.12		8.53	8.00	16.96	13.50
42693	Special Formula	Centreville	1.95	2.00	3.96	3.00	3.00		8.95	8.00	25.24	22.50
42532	Standard	Centreville	1.13	1.00	4.64	4.00	.80		9.65	9.00	22.42	20.00
42633	12-5	Centreville			5.12	5.00	1.30		12.05	12.00	19.99	19.50
42692	Wheat & Grass, (Low Grade)	Centreville	.58	.25	5.08	5.00	1.00		10.55	10.00	21.27	18.75
	Westminster Fertilizer Co., West	**minster, Md.**										
42570	Governor	Westminster	1.59	1.50	1.80	2.00	1.20		10.15	10.00	21.04	20.50
42571	Leader	Westminster	1 35	1.00	1.82	2.00	1.40		9.05	9.00	16.81	17.00
42572	Super A	Westminster	1.25	1.00	1.02	1.00	1.20		8.03	8.00	16.05	14.50
	Harry W. Whistler, Bel Air, Md.											
42548	Crop Grower	Bynum	1.54	1.00	3.02	3.00	.97		8.43	8.00	20.85	17.50
42549	Dissolved Bone	Bynum	2.42	2.00			1.45		10.02	10.00	22.41	20.00
42550	Fish, Bone & Potash	Bynum	1.57	1.00	1.12	1.00	1.05		8.50	8.00	18.24	14.50
	Worcester Fertilizer Co., Snow	**Hill, Md.**										
42634	Acid Phosphate 16%	Snow Hill					.70		14.15	16.00	14.29	16.00
42635	Bumper Crop Grower	Snow Hill	1.55	1.00	3.44	3.00	1.35		10.25	9.00	23.43	18.50
42636	Fish, Bone & Potash	Snow Hill	2.39	2.00	3.12	2.00	1.95		8.80	8.00	25.82	21.00
42637	12-3	Snow Hill			3.96	3.00	.75		12.25	12.00	18.34	16.50
42638	Wheat & Grass Mixture	Snow Hill	1.88	1.00	3.52	2.00	1.60		9.30	8.00	24.30	16.00

*Total Phosphoric Acid.

TABLE II

REGISTRATION OF FERTILIZERS FOR 1921, AFTER AUGUST 1

For Key, see Page 19.

FIRMS AND BRANDS	PER CENT. AND SOURCES OF		
	Ammonia (or Nitrogen)	Phosphoric Acid Available	Potash Soluble
Armour Fertilizer Works, Baltimore, Md.			
Farmer's Choice	1 TNb	9 RTb	3 MKD
Star Phosphate 14%	0	14 R	0
Big Crop 10-5-0	10 TADNF	5 RAF	0
Beckley Fertilizer Co., Halfway, Md.			
Wheat and Grass Grower	1½ TCNtF	10 R	4 MDK
Twelve-Five	0	12 "	5 "
One-Eight-Two	1 "	8 "	2 "
Ten-Two	0	10 "	2 "
N. T. Bennett, New Windsor, Md.			
Butcher House Phosphate	1 Tt	9 "	3 MK
Wheat Grower Phosphate	1 "	8 "	2 K
Central Chemical Co., Hagerstown, Md.			
J. B. Jones' Mixture (Low Grade)	.45 B	12 R	5 M
Gro-All Dominion	2.00 TNACFB	10 "	2 DM
Gro-All Great Southern	0	10 "	5 "
Gro-All Penn Special	0	10 "	4 "
Gro-All Pioneer	0	8 "	5 "
Farmers Fertilizer & Feed Co., Westmins'r,Md.			
XXX Phosphate	1 TA	9 R	4 MKD
Hubbard Fertilizer Co., Baltimore, Md.			
Climax Phosphate	1 TAN	7 R	4 MKD
Lime Phosphate (Low Grade)	0	13	0
12-5 Alkaline	0	12 "	5 "
Animal Tankage 9% (Low Grade)	9 T	6	0
1-9-2 Fertilizer	1 TAN	9 "	2 "
14% Phosphate	0	14	0
Nitrate Agencies Co., Baltimore, Md.			
3-12-3	3 NADTFBb	12 RT	3 MS
2-12-2 Wheat Mixture	2 "	12 "	2 "
2-10-2 Fall Grain Mixture	2 "	10 "	2 "
0-10-4 Manure Supplement	0	10 "	4 "
1-8-1 Grain Mixture	1 "	8 "	1 "
3-8-3 Vegetable Grower	3 "	8 "	3 "
2-10-0 Corn and Grain Mixture	2 "	10 "	0
2-12-0	2 "	12 "	0
G. Ober & Sons Co., Baltimore, Md.			
Star Potash Compound	0	12 R	3 MS
L. M. Price & Son, Smyrna, Del.			
12 and 3	0	12 R	3 SM
Reindollar Co., Taneytown, Md.			
Special Mixture	1 T	10 R	4 MD
Wheat Fertilizer	1½ "	9 "	5 "
H. G. Snyder & Co., Keedysville, Md.			
Money Saving Phosphate	2 TNAC	8 R	2 M
Superior Guano Co., Baltimore, Md.			
Acid Phosphate	0	16	0
Half and Half (Low Grade)	0	8 R	1¼ a
Caroline Special	1 cFT	9 RFcT	3 D
Crop Producer	1 "	8 "	1 "
Phosphate and Potash	0	12 R	5 "
Phosphate and Potash	0	10 "	2 "
Swift & Co., Baltimore, Md.			
Golden Grain Grower	2 NAD	8 RB	5 MKD
Grain Fertilizer No. 3	1 "	8 "	3 "
Grain Fertilizer No. 2	1 "	9 "	2 "
Special Wheat Grower	1 "	8 "	4 "
Diamond "B" Fertilizer	3 "	8 "	5 "
Grain Fertilizer No. 2	1 NADT	9 "	3 "
Bone Meal and Phosphate Fertilizer Mixture No. 2	1½ "	18 "	0
Kainit	0	0	14
High Grade Tankage	10 T	0	0
Special Wheat Fertilizer	1 NADT	11 "	4 K

FIRMS AND BRANDS	PER CENT. AND SOURCES OF		
	Ammonia (or Nitrogen)	Phosphoric Acid Available	Potash Soluble
Wm. B. Tilghman Co., Salisbury, Md.			
Bone Tankage Mixture	2 FNAt	12 RF	2 D
Special 1-9-3 Grade	1 AFt	9 "	3 "
High Grade Phosphate and Potash Mixture	0	12 R	5 KM
Special 2-8-4	2 FNAt	8 RF	4 MK
Special 2-8-2	2 "	8 "	2 K
Special Phosphate and Potash	0	10 R	4 MK
United States Guano Co., Baltimore, Md.			
Standard Extra High Grade Acid Phosphate	0	16 R	0
Standard Quick Crop Grower	2 TFA	8½ RB	2 K
Standard Big Four Crop Grower	1 "	9 "	2 "
Standard Sure Growth Guano	2 "	10 "	2 "
E. S. Valliant & Son, Church Hill, Md.			
Standard Fertilizer	1 TAt	9 RT	4 MK
Grain Grower (Low Grade)	½ "	8 "	2 "
Wheat and Grass (Low Grade)	¼ "	10 "	5 "
Special Formula	2 "	8 "	3 "
Wheat Mixture No. 1	1 "	10 "	3 "
Mixture No. 2	0	12 "	5 "
Washington, Alexander & Cook Co., Charles Town, W. Va.			
Regular Potato and Tobacco Grower	1 Tb	8 R	3 K

FERTILIZERS REGISTERED FOR SALE IN MARYLAND.

Before selling fertilizers in Maryland the manufacturers are required to register the various brands in the office of the State Chemist and state the materials from which the Ammonia, Available Phosphoric Acid and Potash are derived.

The list in Table II, page 18, is for fall registrations for 1921 received too late for publication in the August, 1921, bulletin. Table III, pages 20 to 26, is for fertilizers offered for 1922 up to February 10. In order to save space in printing, letters and symbols are used for the various materials, as per the following list:—

KEY TO SYMBOLS USED IN TABLES II AND III.

AMMONIA (Nitrogen)	PHOSPHORIC ACID AVAILABLE	POTASH SOLUBLE
A—Ammonium Sulfate	A—Animal Matter	a—Ashes
B—Bone	B—Bone	C—Cement by-product
b—Base Goods	b—Base Goods	K—Kainit
C—Cyanamid	F—Fish	M—Muriate
c—Crab Scrap	R—Dissolved Rock	m—Sheep Manure
D—Blood	c—Crab Scrap	N—Nebraska Potash (Sulfate and Carbonate)
F—Fish	m—Sheep Manure	S—Sulfate
H—Humus or Peat, Treated	T—Tankage	T—Tobacco Stems
K—Tobacco stems	*Total Phosphoric Acid in Bone	k—Kelp
M—C. S. Meal	**Total Phosphoric Acid in Untreated Rock.	t—Trona (California)
m—Sheep Manure		c—Carbonate
N—Nitrate Soda		B—Sugar Beet Res. Char.
Na—Nitrate of Ammonia		D—Double Manure Salt
T—Animal Tankage		s—Cottonseed-meal
t—Garbage Tankage		n—Nitrate of Potash
L—Linseed Meal		

TABLE III
REGISTRATION OF FERTILIZERS FOR 1922, COMPLETE TO FEB. 10

For Key, see Page 18.

FIRMS AND BRANDS	PER CENT. AND SOURCES OF		
	Ammonia (or Nitrogen)	Phosphoric Acid Available	Potash Soluble
Amer. Agricul. Chem. Co., New York, N. Y.			
14% Acid Phosphate	0	14	0
16% Acid Phosphate	0	16	0
Basic Lime Phosphate (Low Grade)	0	13	0
Big Crop Phosphate	0	8 R	5 MKD
Dissolved Phosphate and Potash	0	10 "	2 "
Three-Star Phosphate and Potash	0	10 "	4 "
Superior Phosphate and Potash	0	12 "	3 "
Victory Phosphate and Potash	0	12 "	5 "
Ammoniated Superphosphate (Low Grade)	1 TNAFC	8 RTF	0
Ammoniated Fertilizer A	1 "	10 "	0
Ammoniated Fertilizer AA	2 "	10 "	0
5-8-0 Fertilizer	5 "	8 "	0
Climax Top Dresser	5 "	8 "	0
Fish Guano 1916	1 TF	8 RTF	1 "
The Pathfinder 1920	1 TNACF	9 "	3 "
White Oak Compound	1 "	12 "	2 "
Matchless Potash Manure	2 "	8 "	2 "
Rival Fish Compound	2 "	8 "	4 "
Peerless Vegetable and Grain Grower	2 "	8 "	5 "
H. G. Potash Compound	2 "	8 "	10 "
Red Dragon Guano	2 "	12 "	2 "
Sweepstakes Tobacco Fertilizer	3 "	8 "	3 "
Big Crop Fish Fertilizer	4 "	8 "	4 "
4-8-4 Fertilizer	4 "	8 "	4 "
Bull Head Potato Manure	5 "	6 "	7 "
Early Truck Grower	5 "	7 "	5 "
Big Crop 7% Potato Fertilizer	7 "	6 "	5 "
Special Bone Mixture	1½	19*	0
Dissolved Animal Bone	2½	12	0
Fine Ground Bone	3	22.88*	0
Pure Bone Meal	4½	21.50*	0
Nitrate of Soda	18.23	0	0
Tankage	6	13.73*	0
Muriate of Potash	0	0	48
Kainit	0	0	12.40
7-8-0 Fertilizer	7 TNAFC	8 RTF	0
Plant Bed Fertilizer	10 "	5 "	0
Alexandria Brands, A. A. C. Co.			
H. G. 16% Acid Phosphate	0	16	
Reliable Fish Mixture	1 "	10 "	0
Standard Amm'd Superphosphate	2 "	10 "	0
Ammoniated Dissolved Bone	2 "	8 "	0
Gilt Edge Compound	1 "	8 "	2 MKD
Planters' Favorite	1 "	8 "	2 "
Fish Bone and Potash	2 "	8 "	4 "
Bowker's Brands, A. A. C. Co.			3 "
16% Acid Phosphate	0	16	
Sure Crop Phosphate	1 "	8 "	0
Square Brand Farm and Garden Phosphate	2 "	8 "	2 "
Corn and Wheat Guano	2 "	8 "	2 "
All Round Fertilizer	3 "	8 "	4 "
Canton Chemical Brands, A. A. C. Co.			4 "
Eagle Phosphate (L. Gr.)	1 "	7 "	1 "
Harrow Brand Crop Grower	1 "	8 "	1 "
Resurgam Guano	1 "	8 "	4 "
Baker's Spec. Wheat, Corn and Gr. Mixt	1 TNAFC	9 RTF	2 MKD
Baker's Standard Guano	2 "	8 "	3 "
Baker's Fish Guano	2 "	8 "	2 "
CCC Special Compound	3 "	8 "	4 "
Cope Brands, A. A. C. Co.			
H. G. Superphosphate	0	16	0
Wheat and Grass Special	1 "	8 "	1 "
Special Phosphate	1 "	9 "	3 "
Try Me	2 "	8 "	2 "
Detrick Brands, A. A. C. Co.			
Imperial Compound	1 "	8 "	2 "
Standard Potash Fertilizer	1 "	9 "	3 "

FIRMS AND BRANDS	PER CENT. AND SOURCES OF Ammonia (or Nitrogen)	Phosphoric Acid Available	Potash Soluble
Royal Crop Grower	2 TNAFC	8 RTF	2 MKD
Kangaroo Komplete Kompound	2 "	8 "	3 "
Quickstep Fertilizer	3 "	8 "	4 "
Gold Eagle	3 "	6 "	6 "
Special Trucker	5 "	7 "	5 "
Gold Basis	7 "	6 "	5 "
W. S. Farmer Brands, A. A. C. Co.			
H. G. Superphosphate	0	16	0
Clyde Brand 1916	1 TNFAC	8 RTF	1 MKD
Diamond Brand	1 "	8 "	2 "
Potash Guano	1 "	8 "	4 "
Harvest Queen	1 "	9 "	3 "
Fish Mixture	2 "	8 "	2 "
Standard Phosphate	2 "	8 "	4 "
Anne Arundel Trucker	5 "	7 "	5 "
Potato Guano	7 "	6 "	5 "
Tobacco Plant Bed Fertilizer	10 "	5 "	2 "
S. M. Hess & Bro. Brands, A. A. C. Co.			
Special H. G. Acid Phosphate	0	16	0
Processed Phospho Lime (L. Gr.)	0	13	0
Ammoniated Grain Grower (L. Gr.)	1 TNAFC	8 RTF	0
Keystone Phosphate	1 "	8 "	1 MKD
Wheat, Corn and Grass Manure	1 "	8 "	2 "
Special Compound	1 "	8 "	4 "
Fish and Potash Manure	2 "	8 "	3 "
Lazaretto Brands, A. A. C. Co.			
Excelsior AAA (Low Grade)	1 "	7 "	1 "
Farmers' Choice Brand	1 "	8 "	2 "
Special Potato and Tomato Fertilizer	1 "	8 "	4 "
Big Crop Grower	2 "	8 "	2 "
Farmers' Reliable	2 "	10 "	2 "
Special Tobacco and Potato Fertilizer	3 "	8 "	4 "
Lister's Brands, A. A. C. Co			
H. G. Acid Phosphate	0	16	0
Lime Phosphate (Low Grade)	0	13	0
Potash Mixture	0	8 R	5 MKD
Grain and Grass Fertilizer	0	10 "	2 "
Phosphoric Acid and Potash	0	10 "	4 "
Plant Food 1916	1 TNAFC	10 RTF	0
Golden Sheaf	1 "	8 "	1 "
Squirrel Brand Fertilizer	1 "	8 "	2 "
G. Brand	1 "	8 "	4 "
Fish Brand Fertilizer	1 "	9 "	2 "
Harvest Queen Phosphate	1 "	9 "	3 "
Success Fertilizer	2 "	8 "	2 "
Corn and Potato Fertilizer	2 "	8 "	3 "
Big Crop Grower	2 "	8 "	4 "
A. B. C. Fertilizer	2 "	12 "	2 "
Bright Leaf Tobacco Guano	3 "	8 "	3 "
3-6-6 Fertilizer	3 "	6 "	6 "
Standard Pure Superphosphate of Lime	3 "	9 "	2 "
Special Vegetable Manure	4 "	8 "	3 "
Special Truck Fertilizer	4 "	8 "	4 "
5% Vegetable Fertilizer	5 "	7 "	5 "
Special 7% Potato Guano	7 "	6 "	5 "
Bone Meal 1916	3 "	22.88*	0
Patapsco Guano Co. Brands, A. A. C. Co.			
Pat. H. G. Acid Phosphate	0	16	0
Pat. Lime Phosphate, Crow Brand (L. Gr.)	0	13	0
Pat. Soluble Phosphate and Potash	0	10 R	2 MKD
Baltimore Soluble Phosphate	0	12 "	3 "
Sea Gull Guano	1 TNAFC	8 RTF	1 "
Pat. Money-Maker	1 "	8 "	2 "
Pat. Grain and Grass Producer	1 "	8 "	4 "
Possum Brand	1 "	9 "	1 "
Coon Brand Guano	1 "	9 "	2 "
Pat. Big Chief Brand with Potash	1 "	9 "	3 "
Pat. Complete Manure	3 "	8 "	4 "
Pat. Potato Manure with Potash	4 "	8 "	3 "
Pat. Early Trucker	5 "	7 "	5 "
Pat. 7% Potato Manure	7 "	6 "	5 "
Pat. Plant Bed Fertilizer	10 "	5 "	2 "
Pollock Brands, A. A. C. Co.			
H. G. Superphosphate	0	16	0
Corn and Oats Special (Low Grade)	1 "	7 "	1 "

FIRMS AND BRANDS	PER CENT. AND SOURCES OF		
	Ammonia (or Nitrogen)	Phosphoric Acid Available	Potash Soluble
Corn, Wheat and Tomato Guano	1 TNAFC	8 RTF	1 MKD
Special Wheat and Corn Fertilizer	1 "	8 "	2 "
Crop Invigorator	1 "	8 "	4 "
Bull's Eye Guano	2 "	8 "	2 "
Special Potato and Tobacco Fertilizer	2 "	8 "	4 "
Victor Brand	0	8 R	5 "
Soluble Phosphate	0	10 "	2 "
Our Brand Guano (Low Grade)	1 NTAFC	8 RTF	0
Slingluff Brands, A. A. C. Co.			
10% Tobacco Plant Bed Fertilizer	10 "	5 "	2 "
Susquehanna Brands, A. A. C. Co.			
H. G. Superphosphate	0	16	0
Alkaline Phosphate	0	10 R	2 MKD
XXV Phosphate	1 TNAFC	8 RTF	1 "
Ammoniated Phosphate	2 "	8 "	2 "
J. E. Tygert Brands, A. A. C. Co.			
Victor Crop Grower	1 "	8 "	4 "
Standard Fertilizer	2 "	8 "	2 "
7% Potato Guano	7 "	6 "	5 "
Wheeler Brands, A. A. C. Co.			
H. G. Acid Phosphate	0	16	0
Wheat and Clover Fertilizer	0	10 R	2 MKD
Ammoniated Corn Phosphate	2 TNAFC	10 RTF	0
Royal Wheat Grower	1 "	8 "	2 "
Corn Fertilizer	2 "	8 "	2 "
Complete Manure	5 "	7 "	5 "
H. G. Truck Fertilizer	7 "	6 "	5 "
Wooldridge Brands, A. A. C. Co.			
Florida Acid Phosphate	0	14	0
H. G. Acid Phosphate	0	16	0
Lime Phosphate (Low Grade)	0	13	0
No. 2 Phosphate and Potash	0	8 R	5 MKD
American Potash Mixture	0	10 "	2 "
Grain and Grass Producer	6	10 "	4 "
Liberty Bell Potash Mixture	0	12 "	3 "
General Crop Grower (Low Grade)	1 TNAFC	8 RTF	0
Old Fidelity Phosphate	2 "	10 "	0
Fish Mixture No. 2 (Low Grade)	1 "	7 "	1 "
Ammoniated Phosphate	1 "	8 "	1 "
Clover Blossom	1 "	8 "	2 "
Triangle Brand	1 "	8 "	4 "
Champion Stag Phosphate	1 "	9 "	2 "
Surety Crop Grower	1 "	9 "	3 "
Fish Mixture No. 2	2 "	8 "	2 "
Chieftain Phosphate	2 "	8 "	2 "
Triumph Brand Phosphate	2 "	8 "	3 "
Special Potato and Tobacco Fertilizer	2 "	10 "	2 "
Special Pea Fertilizer	2 "	10 "	3 "
Sweepstakes Fertilizer	3 "	8 "	3 "
Sovereign Trucker	5 "	7 "	5 "
Golden Crown Truck Phosphate	7 "	6 "	5 "
Zell Brands, A. A. C. Co.			
16% Acid Phosphate	0	16	0
Electric Phosphate	0	10 R	2 MKD
Little Treasure (Low Grade)	1 TNAFC	7 RTF	1 "
Economizer Phosphate	1 "	8 "	2 "
Hustler Phosphate	1 "	9 "	3 "
Ammoniated Superphosphate	2 "	8 "	2 "
Truck Manure	2 "	8 "	3 "
Special Compound	3 "	8 "	4 "
Truck Grower	5 "	7 "	5 "
American Fertilizing Co., Baltimore, Md.			
Best Potato Formula	4 Nt	8 RB	6 MSKTc
Best Crop Formula	2 "	10 "	6 "
Eastern Shore Potato Special	7 "	6 "	5 "
Early Truckers' Special	5 "	6 "	5 "
Excelsior Guano	2 "	8 "	5 "
Stable Manure Substitute	3 "	7 "	4 "
Champion Grain Grower	1 "	8 "	4 "
Fish and Bone Compound	2 "	8 "	3 "
Grain and Grass Grower	1 "	9 "	3 "
Premium Grain and Clover Mixture	2 "	12 "	2 "
Eagle Crop Grower	2 "	8 "	2 "
Ammoniated Crop Compound	1 "	8 "	2 "
Special Formula (Low Grade)	1/2 "	8 "	2 "
Strawberry and Pea Special	7 "	6 "	1 "

FIRMS AND BRANDS	PER CENT. AND SOURCES OF		
	Ammonia (or Nitrogen)	Phosphoric Acid Available	Potash Soluble
Reliable Guano	1 NT	8 RB	1 MSKTc
Special Formula (Low Grade)	½ "	8 "	1 "
Fish and Bone Special	2 "	11 "	0
Special Fish Guano	1 "	10 "	0
Reliable Grain Formula (Low Grade)	½ "	10 "	0
Formula for Wheat and Corn	0	10 R	5 "
Prize Alkaline and Potash	0	12 "	3 "
Dissolved Phosphate and Potash	0	10 "	2 "
H. G. Acid Phos	0	16	0
Acid Phosphate	0	14	0
Phospho Tobacco (Low Grade)	0	13	0
Armour Fertilizer Works, Baltimore, Md.			
Big Crop Acid Phosphate, 16%	0	16	0
Big Crop 0-10-5	0	10 R	5 MK
Big Crop 0-12-5	0	12 "	5 MKD
Big Crop 2-12-2	2 TANF	12 RTF	2 KMD
Big Crop 2-10-4	2 "	10 "	4 "
Big Crop 2-8-5	2 "	8 "	5 "
Big Crop Bone Mixture 2-9-3	2 TBANF	9 RBTF	3 "
Big Crop 3-8-3	3 AND	8 R	7 "
Big Crop 4-8-4	4 TANFb	8 RTFb	4 "
Big Crop 5-8-5	5 "	8 RTF	5 "
Big Crop 7-6-5	7 TANFD	6 "	5 "
Big Crop 10-5-0	10 "	5 "	0
Big Crop 5-8-7	5 "	8 "	7 "
Phosphate and Potash No. 1	0	10 R	2 "
Wheat, Corn and Oats Special (Low Grade)	1 TNb	7 RTb	1 "
Crop Grower	1 "	8 "	2 "
Royal Ammoniated	1 "	8 "	4 "
Grain Grower	2 TANFb	8 RTFb	2 "
Big Crop Bone Meal	3	22*	0
Big Crop Raw Bone Meal	4½	21.50*	0
Big Crop Nitrate of Soda	18	0	0
Top Dresser	5 ATNFD	8 RTF	0
Big Crop Muriate of Potash	0	0	48
Ground Animal Tankage	9	0	0
Kainit	0	0	12
Fish Scrap	11	0	0
Armour Fert. Wks.—Tuscarora Brands.			
Acid Phosphate, 16%	0	16	0
Phosphate and Potash	0	10 R	2 MKD
Alkaline	0	10 "	5 "
Ammoniated Phosphate (Low Grade)	1 TNB	7 RTb	1 "
Crop Grower	1 "	8 "	2 "
York State Special	1 "	8 "	4 "
Standard	2 TANFb	8 RTFb	2 "
Big Four	2 TANF	7 RTF	4 "
Cereal Special No. 3	2 "	12 "	2 "
Cereal Special No. 2	2 "	10 "	4 "
Favorite	5 TANDF	8 "	5 "
7% Trucker	7 "	6 "	5 "
Associated Chemical Co., Hagerstown, Md.			
Nitrate of Soda	18.20	0	0
Barrett Co., New York, N. Y.			
Arcadian Sulphate of Ammonia	25.25	0	0
Central Chemical Co., Hagerstown, Md.			
"Gro-All" Grain and Grass Grower	2 ACt	12 R	2 MKD
"Gro-All" Crown Jewel	1 Ct	9 "	3 "
"Gro-All" Dissolved Phosphate	0	16	0
L. E. P. Dennis & Son, Crisfield, Md.			
7% Potato Grower	7 ANF	6 R	5 M
Special Round Potato Mixture	5 "	6 "	5 MK
No. 1 Fish Mixture	3 AF	7 "	5 "
Economy Fish Mixture	2 F	8 "	3 K
Klondike Fish Mixture	1 "	8 "	3 "
Earp-Thomas Cultures Corp., New York, N. Y.			
Sim-U-plant Tablets	11 A	12 R	15 MS
Farmers & Planters Co., Salisbury, Md.			
High-Grade 7%	7 ANFb	6 "	5 M
Early Vegetable	5 "	8 "	5 "
Early Truck	4 "	8 "	4 "
Sweet Potato Special	3 "	8 "	7 "
Truckers' Mixture	3 "	8 "	4 "
Special Fish Mixture	2 "	8 "	5 "
Fish Mixture	2 TB	8 "	2 MK

FIRMS AND BRANDS	PER CENT. AND SOURCES OF		
	Ammonia (or Nitrogen)	Phosphoric Acid Available	Potash Soluble
General Crop Grower	1 TB	10 R	2 MK
Special Potash Mixture	0	12 "	5 "
F. & P. Peerless (Low Grade)	½ "	8 "	2 "
Griffith & Boyd Co., Baltimore, Md.			
Stable Manure Substitute	3½ NTBADb	5¼ RT	4 MD
Fish, Blood and Potash	1.75 NFTDb	7 RTF	2 MK
Royal Potash Guano	1 NTBb	8 RT	4 MD
Peerless Fertilizer (Low Grade)	½ Tb	8 "	2 KD
Fish and Blood Mixture (Low Grade)	1.75 NFTDb	7 RFT	0
Farmers' Queen	1 NTb	9 RT	3 MK
Peerless Mixture (Low Grade)	½ Tb	8 "	0
Cereal Plant Food	1 NTb	8 "	2 "
Dissolved Animal Bone	2½	10	0
H. G. 16% Acid Phosphate	0	16	0
Special Grain Grower	0	10 R	2 K
Pure Fine Ground Bone Meal	4	20*	0
Soft Ground Bone Meal	3	11*	0
Farmers' Potato Manure	1 NTb	8 RT	6 MD
Special Guano	2 NTADb	8 "	5 "
Special Formula	2 "	10 "	4 "
Standard Guano	2 "	12 "	2 "
14% Acid Phosphate	0	14	0
Fish and Potash Guano	1.75 NFTb	7 RTF	3 MK
Valley Fertilizer (Low Grade)	.75 Tb	8 RT	3 "
XX Potash Manure	0	10 R	5 MD
Accomac Trucker	5 NTADb	6 RT	5 "
General Crop Grower	2 "	8 "	2 MK
Spring Crop Grower	2 "	6½ "	4½ MD
Reliable Crop Grower	1 NTb	8 "	1 K
Griffith & Turner Co., Baltimore, Md.			
Amm'd Alkaline Plant Food (L. Gr.)	1 "	6 RT	1½ "
Amm'd Butchers' Bone Phosphate	1¼ "	9 "	1½ "
Special Potato Guano	1 "	8 "	4 "
Hubbard Fertilizer Co., Baltimore, Md.			
7% Royal Seal	7 NAFT	6 R	5 MKD
5-8-5 Fertilizer	5 "	8 "	5 "
5% Royal Seal	5 "	6 "	5 "
Yellow Wrapper	3 "	8 "	3 "
Excelsior Mixture	2 "	10 "	0
Money-Maker Fertilizer	2 "	8 "	5 "
Farmers' I. X. L.	2 "	8 "	2 "
Oriental Guano	1 "	10 "	0
1-8-3 Fertilizer	1 "	8 "	3 "
1-8-2 Fertilizer	1 "	8 "	2 "
Fish Mixture	1 "	8 "	1 "
Fish and Potash Mixture (Low Grade)	½ "	8 "	2 "
H. G. Potash Mixture	0	10 "	4 "
Phosphate and Potash	0	10 "	2 "
16% Phos	0	16	0
Tobacco Bed Fertilizer	10 "	2 "	0
Noxali Guano	4 "	8 "	4 "
Top Dresser 10-5-0	10 "	5 "	0
Medford Fertilizer Works, Medford, Md.			
No. 2	1t	8 R	1 K
Mutual Rendering Co., Philadelphia, Pa.			
Bone Meal	3	23.60*	0
Florists' Tankage	6	0	0
Natural Guano Co., Aurora, Ill.			
Pulverized Sheep Manure	2.73	1	1½
Norwegian Nitrogen Products Co., Inc., New York, N. Y.			
Norwegian Nitrate of Lime	15.81	0	0
Peerless Fertilizer Co., Chestertown, Md.			
American Standard	4 BNF	6 RF	5 MK
Peerless	2 FN	8 "	3 "
Ford's Ideal (Low Grade)	½ "	8 "	3 "
Wheat Grower (Low Grade)	½ AT	10 RB	5 "
Fish Mixture	2 BFN	8 RFB	1 K
Rasin-Monumental Co., Baltimore, Md.			
Best Crop Formula	2 NANaC	10 RB	6 MSKTDc
Eastern Shore Potato Special	7 "	6 "	5 "
Early Truckers' Special	5 "	6 "	5 "
Best Grain and Grass Formula	2 "	10 "	4 "
National Crop Compound	1 "	8 "	4 "
Royal Fish, Bone and Potash	2 "	8 "	3 "
Capital Crop Compound	1 "	9 "	3 "

FIRMS AND BRANDS	PER CENT. AND SOURCES OF		
	Ammonia (or Nitrogen)	Phosphoric Acid Available	Potash Soluble
Empire Guano	2 NANaC	8 RB	2 MSKTDc
United Grain Grower	1 "	8 "	2 "
Wheat, Corn and Oats Mixture (L. Gr.)	½ "	8 "	2 "
William Penn Crop Grower	1 "	8 "	1 "
Royal Manure (Low Grade)	½ "	8 "	1 "
Special Fish and Bone Guano	2½ "	11 "	0
Special Fish Mixture	1 "	10 "	0
H. G. Phosphate and Potash	0	12 R	5 "
Special Phosphate and Potash	0	10 "	5 "
Soluble Alkaline Phosphate	0	12 "	3 "
Phosphate and Potash Fertilizer	0	10 "	2 "
16% Acid Phosphate	0	16	0
Acid Phosphate	0	14	0
Special Corn Mixture (Low Grade)	0	10	0
Phospho Tobacco (Low Grade)	0	13	0
Basic Lime Phosphate (Low Grade)	0	13	0
F. S. Royster Guano Co., Baltimore, Md.			
Lime Phosphate (Low Grade)	0	13	0
16% Acid Phosphate	0	16	0
8-5 Phosphate and Potash	0	8 R	5 MD
10-2 Phosphate and Potash	0	10 "	2 "
12-5 Phosphate and Potash	0	12 "	5 "
Royal Blue Brand	1 ATF	10 RB	0
Cuckoo Guano	1 "	8 "	1 "
Economy Guano	1 "	8 "	2 "
Wonder Guano	1 "	8 "	3 "
Dreadnought Guano	2 "	8 "	2 "
Fish, Flesh and Fowl	2 "	8 "	3 "
Bully Guano	2 "	8 "	5 "
Vim Guano	2 "	12 "	2 "
Scott Fertilizer Co., Elkton, Md.			
Sure Growth Compound	4 NTF	7 R	7 M
Victory Brand	2 TAt	8 "	3 "
Potato Grower	2 ATD	8 "	6 "
Sure Growth Superphosphate	2 ATt	8 "	2 "
Standard	1 Tt	9 "	3 "
Pennsylvania Potato Grower	1 ATt	8 "	2 "
Special Grain Grower (Low Grade)	½ Tt	8 "	4 "
Wheat and Grass (Low Grade)	½ "	8 "	2 "
Ground Raw Bone	4½	21*	0
Soluble Phosphate and Potash	0	10 R	5 M
Soluble Phosphate and Potash	0	12 "	2 "
Tip-Top Soluble Phosphate	0	16	0
Summers Fertilizer Co., Baltimore, Md.			
All-Crop Grower	2 ATN	8 RB	5 KD
Soil Improver	1 "	9 "	3 "
Swift & Co., Baltimore, Md.			
Special Top Dresser	10 NAT	5 RB	0
Top Dresser Formula No. 1	7 "	8 "	0
Royal Tomato Grower	2 "	7 "	5 MSKD
Raw Bone Meal Fertilizer	4½	23*	0
Bone Meal Fertilizer	3	24*	0
Special Wheat and Corn Grower	2 NAT	10 RB	4 "
Red Steer	2 "	8 "	2 "
Reliable Grain Fertilizer	1 "	8 "	1 "
Golden Grain Grower	2 "	8 "	5 "
Diamond C Fertilizer	2 "	8 "	4 "
Champion Wheat and Corn Grower	2 "	12 "	2 "
Canning Crop Fertilizer	4 "	8 "	4 "
Grain Fertilizer	1 "	8 "	2 "
Special Wheat Grower	1 "	8 "	4 "
Diamond B Fertilizer	3 "	8 "	5 "
Early Potato Grower	5 "	8 "	5 "
Southern Planters' Favorite	3 "	8 "	3 "
Hummer	7 "	6 "	5 "
Monmouth Co. Potato Manure	4 "	8 "	5 "
High-Grade Special	3 "	12 "	3 "
Farmers' Home	0	10 R	4 "
Special Phosphate and Potash	0	10 "	2 "
Special H. G. Phosphate and Potash	0	12 "	5 "
Kainit	0	0	14
Farmers' Favorite (Low Grade)	¼ NAT	10 RB	1 "
Early Trucker	5 "	7 "	5 "
Onion, Potato and Tobacco Grower	2 "	8 "	7 "
Monarch Phosphate and Potash	0	12 R	3 "

FIRMS AND BRANDS	PER CENT. AND SOURCES OF					
	Ammonia (or Nitrogen)		Phosphoric Acid Available		Potash Soluble	
H. G. Acid Phosphate Fertilizer	0		16		0	
Wheat Grower Phosphate and Potash	0		12	R	2	MSKD
Nitrate of Soda	18		0		0	
Red Steer for Bright Tobacco	2	DA	8	"	2	S
Virginia Tobacco Grower	3	"	8	"	3	"
Virginia-Carolina Chem. Co., Baltimore, Md.						
Best Truck and Vegetable Formula	4	NCANat	10	RB	6	SMKTDc
Basic Lime Phosphate (Low Grade)	0		13		0	
Mammoth Tobacco Grower	5	"	8	"	2	"
Tobacco Standard	2	"	8	"	1	"
Tobacco Special	2	"	9	"	5	"
Plant Bed Special	10	"	4	"	0	
Best Potato Formula	4	NANaCt	8	RB	6	MSKTc
Eastern Shore Potato Special	7	"	6	"	5	"
Early Truckers' Special	5	"	6	"	5	"
National Ammoniated Guano	1	"	8	"	4	"
Fish, Bone and Potash	2	"	8	"	3	"
One, Nine and Three	1	"	9	"	3	"
Standard Crop Grower	2	"	8	"	2	"
Standard Grain Grower	1	"	8	"	2	"
Standard Corn and Grain Grower (L. Gr.)	½	"	8	"	2	"
Special Compound	1	"	8	"	1	"
Champion Manure (Low Grade)	½	"	8	"	1	"
Fish and Bone Mixture	2	"	11	"	0	
Special Fish Preparation	1	"	10	"	0	
Special Phosphate and Potash	0		10	R	5	"
Special Soluble Alkaline Phosphate	0		12	"	3	"
Standard Phosphate and Potash	0		10	"	2	"
16% Acid Phosphate	0		16		0	
Phospho Tobacco (Low Grade)	0		13		0	
F. M. Wilson, Pocomoke City, Md.						
Favorite	5	NF	8	R	5	M
Peninsula	2	"	12	"	1¼	"
York Chemical Works, York, Pa.						
Grain Special	2	ANT	12	RT	2	MD
Standard Potash	1	"	8	"	4	"
One-Eight-Two	1	"	8	"	2	"
One-Eight-One	1	"	8	"	1	"
Prosperity	2	"	12	"	0	
Crop Grower	1	"	10	"	0	
Twelve and Four	0		12	"	4	"
Twelve and Two	0		12	"	2	"
Ten and Two	0		10	"	2	"
Acid Phosphate	0		16		0	

Explanation of Terms Used in Fertilizer Analysis With the Most Common Materials Used

Nitrogen, Ammonia. Nitrogen is an invisable gas and constitutes nearly four-fifths of the bulk of the air. This free or uncombined nitrogen is not taken up by most plants. Plants of the clover family can take up a part of their nitrogen from the air under certain favorable conditions by the aid of certain microscopic plants or bacteria. Nitrogen can be combined with the gas hydrogen forming ammonia gas, which combines with acids forming solids called "salts"; in this case ammonia salts. The one generally used as a fertilizer is Ammonuim Sulfate, which contains about 25% of ammonia. Fourteen parts by weight of nitrogen combine with three parts of hydrogen forming seventeen parts of ammonia. As nitrogen from Nitrates and from Animal or Vegetable matter can be changed into ammonia, it is customary to speak of it in the form of Ammonia and it is so quoted in the fertilizer trade.

Ammonium Sulfate is a by-product from the by-product coke ovens and coal gas works, some ammonia being formed when soft coal is heated in closed retorts. It is the cheapest form of "ammonia" at the present time. It can be mixed with most other fertilizer materials, except lime, wood ashes, cyanamid, or other alkaline substances. It is not quite as quick as nitrate and is held longer in the soil. When mixed with acid phosphate alone the mixture is liable to get hard. If used by farmers for mixing it should only be mixed as used. Organic matter in the mixture will lessen the tendency to harden.

Nitrate of Soda is the principal nitrate used. It is imported from South America and contains nitrogen equivalent to about 18% of ammonia. It it the most quickly availabe source of nitrogen and, next to sulfate of ammonia, the cheapest form. It may be mixed with most other fertilizer ingredients but it takes up moisture from the air and if much of it is used the mixture becomes moist. It is liable, also, to give up some of its nitrogen when mixed with acid phosphate, especially if the latter is fresh and contains free acid. The nitrogen, if lost, is given off as a reddish gas having a suffocating odor and is poisonous and when mixtures of it are stored in large piles in closed rooms it sometimes gives trouble. The acid liberated is also destructive to bags. Mixtures containing much nitrate with acid phosphate should be used within a reasonable time after mixing.

Cyanamid is used to a limited extent in some fertilizers, but not to furnish more than ½ to ¾% of ammonia. When this amount is not exceeded it is a good conditioner of fertilizer and the ammonia is useful. Larger amounts cause loss of nitrogen and unduly revert the phosphoric acid because of the lime present. Cyanamid is made

from calcium carbide (which is made in an electric furnace from lime and coke) by passing free nitrogen from the air over it. The nitrogen combines or is "fixed" Cyanamid contains nitrogen equivalent to about 20% of ammonia.

Organic Ammoniates

The principal organic ammoniates are Animal Tankage, Dried Fish Scrap or Fish Tankage, Dried Blood, Cotton Seed Meal and Garbage Tankage. "Base" is also important. It consists of materials such as hair, feathers, wool waste, shoddy, hair felt waste from gun wad manufacture, fur scraps, leather scraps, etc.,—materials rich in nitrogen but of little value as fertilizer in the raw state. They become available, however, when mixed with ground phosphate rock and treated with strong hot sulfuric acid for a number of hours. The idenity of the original materials is entirely lost in the process. It is sometimes called the "wet process" of mixing as distinguished from mixtures made when dry, or "dry mixing". Wet fish chum is also used in makig "base".

Dried Blood is a by-product from slaughter houses. It contains nitrogen equivalent to about 14% of ammonia. It is a good fertilizer but the supply is limited and most of it is now used for feeding purposes.

Tankage is prepared from the parts of animals that are unfit for human food; sometimes whole carcasses are condemned on account of disease. This animal matter is cooked by steam under pressure in closed digesters or "tanks" made of boiler iron. Most of the grease rises to the top and is separated from the tankage, which is pressed, dried and ground. The quality varies and it is always sold by the analysis. The best grade should contain about 10% of Ammonia and 6% of Phosphoric Acid. When it contains much bone it is called "Bone Tankage". Much of it is now used for feeding stock.

Dead animals are also used for making tankage but such tankage should not be used for feeding purposes.

Dried Fish Scrap, Dried Ground Fish, Fish Tankage, are the names used to designate the product obtained either from the offal from the fish canning industry or, generally, from whole fish that are caught for fertilizer and oil, that have been treated in tanks the same as animal tankage, and the residue dried and ground. The material should contain about 10% of Ammonia and 6% of Total Phosphoric Acid. It has about the same availability as tankage and is also used for feeding poultry and hogs.

Cotton Seed Meal is the principal ammoniate of vegetable origin. It consists of the "meats" of cotton seed, with some of the hulls, that have been pressed to extract much of the oil. The resulting cake is

ground to meal. It should contain 7 to 7½% of Ammonia, 3% Total Phosphoric Acid and nearly 1% of Potash. It is fairly quick-acting but is high in price and most of it is used for cattle feeding in this state.

Garbage Tankage results from treating city garbage in reduction plants by the tankage process, as with animal tankage, to remove most of the grease. The resulting tankage is dried and ground. It is low-grade and slow-acting but it improves the condition of mixed fertilizers, tending to prevent them from getting hard in the bags. It contains nitrogen equivalent to about 4% of Ammonia.

Phosphates.

Phosphoric Acid, P_2O_5, is, chemically speaking, the anhydride of phosphoric acid; that is, with water it forms the real acid. It cannot be used in the free state but always in combination with a "base", generally lime, forming a "salt". With one equivalent of lime it forms the acid phosphate; with two equivalents the "precipitated phosphate" or di-calcium phosphate, which is also available, and with three equivalents of lime it forms the ordinary calcium phosphate as it occurs in bones and phosphate rock, and is not classed as "available" phosphoric acid.

Acid Phosphate, Dissolved Rock, Dissolved Phosphate, are different names for the same thing. Phosphate rock from Florida, Tennessee or South Carolina is washed, dried and ground to a fine powder which is then treated with nearly its own weight of moderately strong sulfuric acid and put in "hot dens" (brick or concrete rooms or bins) where it gets quite hot from the chemical action. After one or more days it is transferred to an open shed to cool and "ripen", after which it is crushed, screened and shipped, either in bulk or in bags. It should contain at least 16% of Available Phosphoric Acid. It also contains over 50% of hydrated calcium sulfate, which is the same as "land plaster". This plaster is formed by the sulfuric acid combining with the excess lime in the raw phosphate, and is not added as a filler. Acid phosphate is by far the most important source of phosphoric acid in fertilizers. Phosphoric acid in dissolved bone is as good but no better, while that from raw or steamed bone is very much slower in its action.

Raw Bone should contain from 4½ to 5% of Ammonia and 21% of Total Phosphoric Acid. It should be finely ground.

Steamed Bones are bones that have been steamed in closed tanks, as in the case of tankage, to remove most of the grease. The steaming also removes more or less of the nitrogenous matter, depending on the amount of steaming. They should contain from 1½ to 3% of Ammonia and about 25% of total Phosphoric Acid.

Potash

Potash is the metal potassium combined with oxygen (K_2O) and is a chemical curiosity and never used as a fertilizer in the pure state. In fact the substance rapidly takes up water from the air, forming caustic potash, which is a plant poison. However, when combined with acids it forms "salts", as the sulfate of potash, chloride (muriate) of potash, carbonate of potash, etc., and these compounds are used as fertilizers.

Kainit is a mixture of compounds of potash, soda and magnesia just as removed from the mines of Europe, and ground fine. It contains from 12 to 14% of actual Potash, all soluable in water.

Muriate of Potash is manufactured by a purification and crystallization from crude salts, as kainit. The grade used for fertilizer contains the equivalent of 50 to 54% of Potash.

Sulfate of Potash is also prepared from the crude potash salts but is more difficult to prepare than the muriate and costs more. It contains 48 to 50% of Potash. It should be used in tobacco fertilizers, especially if the tobacco is to be used for smoking.

Manure Salts are prepared from the crude potash salts by a partial purification. They contain about 20% of Potash.

American Potash from several sources is on the market and is as valuable for fertilizers as the European, unit for unit of potash. It is, of course, always sold on guarantee.

Some other materials are sometimes used in fertilizers, as will be noted in the list given on page 19.

High-Grade versus Low-Grade Fertilizers.

High-grade and Low-grade are relative terms and one cannot draw a sharp line between the two. All authorities and all honest manufacturers are agreed, however, that it is real economy to use the high-grade. The fact that low-grade mixtures are still used makes it necessary to repeat this warning. A 1-8-1 mixture should be regarded as low grade. It cannot be made without the use of considerable make-weight or filler; yet some fertilizers are sold with guarantees of ¼-8-½. Most manufacturers are ashamed to offer such fertilizers and, when asked about it, claim that some consumers want the extremely low-grade.

A 1-8-1 can be made up in a great number of ways. Several formulas are as follows:

1.	1000 lbs.	"Base" (2¼-14-0)
	150 "	Dissolved Rock 16%
	200 "	Kainit, 12%
	750 "	Sand
	2000 lbs	

2
500 lbs. Garbage Tankage (4% ammonia)
1000 " Dissolved Rock (16% A. P. A.
200 " Kainit (12% potash)
300 " Sand.

2000 lbs.

3.
200 lbs. Fish, dried, ground, or Tankage, (10% ammonia 5% P. A.
950 " Dissolved Rock, 16%
88 " Muriate of Potash, 50%.
762 " Sand.

2000 lbs.

In some cases the above are calculated to slightly overrun in analysis. This "overage" should be from 0.1 to 0.2% for ammonia and potash and about 0.5% on available phosphoric acid, when the mixture is to be sold, otherwise one or two of the items will probably be found short on analysis, due to slight irregularities in the ingredients or in the mixing.

The following are high-grade formulas:—

3-11-3
400 lbs. Fish or Animal Tankage (10% ammonia)
1350 " Dissolved Rock.
125 " Muriate of Potash.

2000 lbs.

The calculation of the analysis of a mixture is a very simple matter when the analysis of the ingredients is known. The analysis of each ingredient should be multiplied by the fractional part that the ingredient makes up of the mixture. In the above formula 400 lbs. of Fish (or tankage) is $\frac{1}{5}$ of the mixture. $\frac{1}{5}$ of 10% (the analysis of the fish) is 2%. To this is to be added $\frac{125}{2000}$, or $\frac{1}{16}$ of the analysis of Nitrate of Soda (18%), which is 1.12%, giving the total Ammonia 3.12%. The mixture is $\frac{1}{16}$ Muriate of Potash, and $\frac{1}{16}$ to 50% (the potash in muriate), or 3.12% of Potash in the mixture.

A still more concentrated fertilizer, to test 4-10-6, good for potatoes, can be made as follows:—

200 lbs. Nitrate of Soda.
200 " Sulfate of Ammonia.
1350 " Dissolved Rock.
250 " Muriate of Potash.

The theoretical analysis of this is, Ammonia 4.3% Available Phos. Acid 10.84%, and Potash 6.25%.

CAUTION. High grade fertilizers, with the plant food mostly soluble, should be used in such a way that it does not come in direct

contact with germinating seeds or young plants. Such fertilizers sometimes do more harm than good, especially when they are applied in the potato rows and the seed potatoes are dropped in the fertilizer. Mix the fertilizer with the soil. The heavier the application the more thorough should be this mixing.

The Tonnage and Grades of Fertilizers Used in Maryland

The figures for the total number of tons of fertilizers used each year by Maryland farmers have only been available beginning with the year 1913. These amounts are given below, in most cases to the nearest thousand. The figures for 1921 are subject to slight revision, as the returns are not all in. The figures show, however, that the tonnage for 1921 was about 25% below normal.

Reports from manufacturers of fertilizers by brands was commenced for the year 1919 and a summary of the reports for that year was given in our report Bulletin No. 91. A similar report is given below, with slightly more detail, for 1920. The first two or three items are mainly dried peat, dried manure, etc.

The most popular mixed fertilizer is the 2-8-2 (2% ammonia, 8% available phosphoric acid and 2% potash), giving 12% of total plant food. It would be more economical to use a still higher grade. Mixed fertilizers, as a rule, should contain at least 14% of plant food.

In the table below the first column is the total plant food, the per cent of ammonia, available phosphoric acid and potash added together, tho in some cases there were but two of these in the mixture. Unmixed materials are given separately.

MIXED FERTILIZERS

Total percent	Tons
3	3
4	266
5	40
6	322
7	0
8	33
9	4339
10	15021
11	17020
12	38057
13	16615
14	11049
15	8509
16	10942
17	4188
18	7499
19	1109
20	25
21	916

Dissolved Rock or Acid Phosphate	Percent	Tons
	12	15
	13	1962
	14	3344
	16	21212

MATERIALS

Bone, 3-23	377
Bone, 4½-21½	1398
Bone, steamed, 2½-25	195
Blood, dried	3
Fish, dried, ground	53
Tankage	74
Ammonium Sulfate	147
Kainit	298
Muriate of Potash	306
Nitrate of Soda	1096
"Mixed to Order"	5977
Total	172,410

TONNAGE BY YEARS.

1913, 178,000. 1914, 179,000. 1915, 170,000. 1916, 155,000. 1917, 193,000.
1918, 175,000. 1919, 176,000. 1920, 172,400. 1921, 135,000.